LIEUT.-COLONEL H. C. BYRDE.

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"PIONEERS OF THE PLANTING ENTERPRISE IN CEYLON."

(Second Series.)

LIEUT.-COL. HENRY C. BYRDE (NO. 2),

PLANTER AND MERCHANT IN CEYLON,

AND AFTERWARDS DEPUTY LIEUTENANT AND J.P. FOR CO. MONMOUTH; CHAIRMAN OF PONTYPOOL PETTY SESSIONAL DIVISION; AND HONORARY COLONEL OF 4TH VOL. BATTALION SOUTH WALES BORDERERS.

GEO. BIRD, THE FIRST OF CEYLON PLANTERS.

THE late Lieut.-Col. H. C. Byrde occupied for many years a leading position among the planters and merchants of Ceylon. Apart from owning several coffee plantations, he was the founder of a Planting Agency House in Kandy, which bore his name and that of his son—the Colonel Henry Byrde*, still of the central capital —for many years; and his family had also the prominence and prestige naturally associated with the opening of the very first coffee plantation in the island. The King of Kandy had a so-called coffee garden at Hanguranketa; but the bushes were allowed to grow at their sweet will and undoubtedly the first regularly formed plantation was in 1824 at Sinnapittia, near Gampola, the planter being Mr. Geo. Bird (the name was originally so spelt†)—the uncle of the subject of this memoir—who was aided by Col. Henry C. Byrde the first of the name in Ceylon and father of the gentleman whose portrait we give.

The subject of our memoir is, therefore, the middle one of three Colonels Byrde who have been identified with Ceylon from 1823 onwards. The first was Colonel Henry C. Bird of the 16th Regiment, who arrived in the island in 1823, (accompanied by his brother, Mr. Geo. Bird,) and who became Commandant of Kandy. George Bird himself had been a Cavalry Officer and had come to Ceylon especially to engage in agricultural or planting pursuits. He was a personal friend of the Governor Sir Edward Barnes whose great desire was to see the fine hill country of Ceylon opened up by European capital and planters. Accordingly, Geo. Bird, supported by his brother, set to work and opened in 1824 Sinnapittia near Gampola; while the Governor himself soon after put his money into the opening of Gangaroowa (still known as the "Rajah Tottum") opposite the Royal Botanic Gardens, Peradeniya, having Mr. Wm. Northway, senior, for his Superintendent. We cannot do better at this stage than quote the account furnished by the sub-

* One of the heroes of the Redan and who if he had been left in the Army, in place of being turned into civil life, would probably have proved one of the youngest as well as most active Generals in the British Army.

† The change was made by Colonel Byrde after retiring from Ceylon. A wag, who had the ear of the editor of *Punch*, sent to that publication a *bon mot* to the effect that although a gallant colonel down in Monmouthshire had had his "i" (eye) put out by Royal letters patent, he was doing as well as could be expected under the circumstances, and had found the operation really a painless one.—The joke is not so good as that related to us a few months ago by Sir James Gell, Attorney-General of the Isle of Man. We had previously met Deemster Gill; and referring to the similarity of names, "Yes," said Sir James, "but we are quite distinct families, and on my marrying a sister of the Deemster, it was all the talk that I had put out the eye (i) of Miss Gill!"—ED. T.A.

ject of our memoir (then "Major Bird") to our "Planting Gazetteer" of 1859, of his uncle's career, and the history of his life-long struggles against an adverse fortune. Our prosperous planters of the present day may well regard with respect and honor the name of "George Bird" as the very earliest plantation pioneer in Ceylon—a man of striking character, of superb physical development and strength, unwearied energy and indomitable pluck—and that honor, in a connected degree may be extended to all the "Birds" or "Byrdes" of those early days who gave both time and money to the work of carving coffee estates out of the primeval jungle. George Bird in his early years made a great impression through his work, physical prowess and personal character, on the Kandyans who both respected and feared him. The account supplied to us in 1859 by the subject of our Memoir, was as follows:—

The first Coffee Estate in Ceylon was opened in this District so far back as the year 1821, by Mr. George Bird, who accompanied his brother (Colonel Bird of the 16th Regt.) to Ceylon in 1823 for the purpose of engaging in such agricultural undertaking as inducements in the Island should appear to offer; and the attention of the brothers, (Col. Bird being at that time Commandant of Kandy.) was directed to the cultivation of *Coffee*; and the valloy of Gampola was selected as an eligible locality wherein to carry out their intended speculations.

Sir Jas. Campbell, then Lieut.-Governor, gave encouragement to the proposed undertaking by promising a grant of land for the purpose which was afterward confirmed by Sir E. Barnes, and thus commenced that cultivation on the site of two ancient Kandyan Places, Royal lands (Singapetia and Weyangwatte)—which has been of such importance in the subsequent history of our Island.

The mode of cultivation adopted and the enormous protective duties then in favor of the British West Indian Colonies, rendered this, and two other Coffee Estates at Ganga Orowa and Matelle that soon followed the one at Gampola, equally unprofitable; and Col. Bird's death of cholera in 1829* so paralysed the operations at Gampola that Mr. George Bird was induced to abandon the property in 1833 and remove to Kondasally and subsequently to Imboolpitia in Oudabulatgamma. After having been engaged in the production of Coffee for 33 years with singular want of success he died in Kandy on the 1st March 1857, having been the means of conferring signal advantages on others by the energy of his character, while to himself, the Pioneer of Coffee cultivation, his best efforts served only to prolong his disappointment.—Although a good practical man and possessed of great experience, accumulated through many years of toil, his experience did not avail him until failing health, had destroyed that energy which repeated disappointment could not impair.

The Gampola Estate being beautifully situated in the valley of Gampola, was in 1846 sold to Messrs. Hudson Chandler and Co. for the purpose of farming it on the English principle and combining this with the cultivation of Sugar, and a farmer and his family were brought from England to carry out the intention of converting the already fine pasture lands into a grazing farm—when the decaying stumps of the old Coffee trees gave place to guinea grass to maintain a stock of horses and cattle, with the hope of eventually securing breeds of superior quality;—but on the failure of Messrs. Hudson Chandler and Co. during the crisis of 1848, this establishment was again broken up, and the estate reverted to the Bird family. Within the last 2 or 3 years it has been again formed by Major Bird into a Coffee estate of 300 to 400 acres which give promise at length of great success, now (1859) that the culture and preparation of Coffee are better known, and the equalization of duties gives the agriculturist in the East a fair chance of competition with other parts of the world.

* Col. H. C. Bird No. 1 died of cholera in Colombo in 1829 and his remains are interred in the old military cemetery at Galle Face.

From Mr. Charles Byrde of Ambalangoda, son of the subject of our Memoir, we have the following:—"Mr. George Bird spent his later years at Kondesale Estate with his daughter, Isabella, who married the late Mr. W. B. R. Wyllie of Messrs. Keir, Dundas & Co. and Mr. Geo. Bird died at Lake House, Kandy, early in 1857, as I was living at this time with my father and mother who went to England in May 1857 after Mr. Wyllie's marriage with Isabella Bird."

We need only add to the above, that when misfortune overtook Major Byrde's firm and properties generally, Sinnapittia had to be taken over by Mr. John Boustead, and again it changed hands when the final collapse of Ceylon coffee took place. It is now the property of the Oriental Estates Co., Ltd., and like so many other old coffee plantations, has been turned into a flourishing tea garden of 300 acres out of the total area of some 756 acres.

We cannot do better next than repeat some notes written at our request by the subject of our Memoir, Colonel H. C. Byrde (the 2nd) in 1895, after seeing our first volume of "Pioneers" in which he was greatly interested. The old colonist in his Welsh retirement reminded us that he had been a reader and admirer of the *Observer* from the first day it appeared in 1834, down to (what proved) the closing year of his life, and with his "kindest regards to the Editor" he sent the following very interesting autobiographical sketch accompanied by portraits of himself and other senior members of his family from which we were to select the one to appear in our *Tropical Agriculturist* Gallery:—

I was transferred to the Ceylon Rifle Regiment in July 1834, and waited for three months before there was a ship sailing for Ceylon. My fellow passengers in the "Symmetry" were Mr. (afterwards "Sir") Chas. Peter Layard, Lady Layard, James Gay Layard, Beville Layard, Miss Sophia Mooyart, and Mr. Self, passenger for Mauritius—all gone to their rest.

My uncle George Bird came down to Colombo to greet me and I returned with him to Nau Oya, where he was then living, having commenced the cultivation of his estate at Kondasally, which he was then planting. On my arrival at Colombo I found that there was no notification of my appointment. The ship with Naval stores to Trincomalee and Military stores to Colombo had been ordered to the former station first. There were about two or three ships in those days that graced the Colombo roadstead. Letters for England were sent by tappal to Madras to await an East Indiaman and it was considered satisfactory to get an answer to a letter from Ceylon *within the year*. What a contrast to the present day:—when mail after mail is advertized, the *open* roadstead enclosed by a break-water and

the harbour full of steamships, and Colombo full of visitors, instead of the solitary Military Officer, who probably came out to fill a death vacancy in one or other of the Regiments then stationed in Ceylon. It is worth noticing the mighty change that has taken place in the distant Colony of Ceylon which has in these latter days been brought so near to the mother country.

My uncle had a big horse—one of the Delft stud which had been sold off by order of the Home Government, when Sir Edward Barnes was Governor. My uncle drove me as far as Ambepussa the first day and what astonished me more than anything I can remember was that the *Affghan* horsekeeper *ran* the whole distance of 36 miles holding on by the back of the buggy. This was marvellous to an Englishman, just arriving in the Island and would probably be marvellous even in Ceylon at the present time, though many such wonders have been wrought in Ceylon since that day.

ORIGINAL COFFEE PLANTING AND PREPARATION.

My first visit was to the old Gampola estate, Sinnapitiya, tho trees on this property as well as at Peradeniya the Government plantation, and on Ganga Orowa, were grown in the *native* fashion, no other then being known. The preparation was equally original—the Gampola Store was a four-sided building enclosing an open space used for drying ground. The coffee in husk was, at this time, dried ready for grinding; this was done by *grooved rubbers* sloping to one side, and fixed on 3 legs with a hopper on top. This contrivance (an invention of my uncle's) ground off the husk, and the whole was then winnowed by a corn-winnower and finally prepared for shipment and bagged on the estate. It is worthy of remark that up to about this time, the sale price of Ceylon in the London market was about 28s or 30s per cwt. This was caused by the excessive duty of 9d per lb. on all coffee shipped *eastward of the Cape*, while West Indies' coffees were admitted at 6d. This unjust difference was equal to about 28s per cwt., but for this, Ceylon coffee might, in the early stages, have sold for 56s instead of 28s. The duty was however equalized and levied at 6d., after some strong representations to the Home Government, but the earliest planters had this terrible "odds" to contend with, and rejoiced when the duties were equalized. I need hardly mention that at this time all the cultivation of coffee was in the *native fashion*, and required a great amount of manure to maintain; this was the case on the 3 plantations then known:—Gampola, Peradeniya, and Gangarowa, and subsequently on Major Forbes's at Matale.

Some mention is due of Hanguranketa—this was the site of a former palace of the King of Kandy and of a Buddhist Temple, at one time of some eminence. About this palace and temple were coffee trees grown, of course, in the native fashion and rising above was a mountain side of coffee *jungle*. The Kandyan legend of this, is that before coffee was known as a beverage, some pilgrims brought the *seeds* (coffee in husk) from Arabia to grow flowers for offerings to the Temple, and that the coffee beans had been distributed in course of years throughout the adjoining forest by the small green parrots which abound in that district.

On the failure of the Gampola plantation, partly in consequence of my father's, Colonel Byrde's death of cholera in 1829, as he had provided the necessary funds,—Mr. George Bird applied to the Governor to have the Old Palace at Hanguranketta coffee jungle sold and it was put up for sale by auction, the limit of £600 was prescribed by Messrs. Acland and Boyd was exceeded by Mr. De Soysa, who became the purchaser at £630, and thus formed the nucleus of his subsequent fortunes, which grew rapidly as arrack renter.

The Governor, after this, made Mr. George Bird a grant of 600 acres of land at Kondasally, where he renewed his cultivation of coffee in partnership with Messrs. Acland Boyd & Co. of Colombo. On my first arrival in the Kandyan country I was taken to visit this new *venture*, the coffee planted was with stumps and it was affirmed that the *greater* the *number* of shoots the better, nothing like a good *bushy tree*, it was said (again native fashion). This was, however, sont altered; for, in 1837, our good trusty friend, o Rober Boyd Tytler, made his appearance with the knowledge he had gained by a residence for instruction on the Blue Mountains of Jamaica, and the great change was partly brought about by an old copy of *The Coffee Planter of St. Domingo* by M. Laborie which Mr. William Boyd had picked up on a second-hand bookstall in London. All was now changed. Trees were to be grown on *one stem*. The plants to be reared from seed, the trees topped at certain heights. M. Laborie gave even plans of the "grater mill" as it was called—Barbacues for drying the parchment coffee and the *peeling mill* for grinding the coffee when dry, with divers instructions for the cultivation. This book and our friend Tytler's knowledge and guidance caused a stir and a revolution that *after-comers* could hardly realize, who flocked to Ceylon to find matters so settled, as if there had been no change, albeit one improvement after another was carried out in improved cultivation and preparation, which produced the fortunes of many, until the climax of leaf-disease *prostrated* the enterprize of coffee cultivation almost entirely. I would next notice the remarkable success of the coffee planting experiment

AT BLACK FOREST.

M. Laborie in his St. Domingo Coffee Planter, lays it down as a rule that the soil for the successful cultivation of coffee should be loose, *friable* and if possible on *virgin cleared* forest land. Our friend Tytler visited Gampola with me and gave it as his opinion that the soil was too *compact* for the successful growth of coffee which grew splendidly under the old "jak" trees where it was nourished by the leaves, and the soil kept moist and loose. I mention this peculiarity, as it equally applies to Peradeniya and Ganga Orowa where the soil was of the same character, and the coffee trees equally *impeded* in their growth. My attention was therefore directed to the forest called "the Black Forest of Pussellawa" which for magnificent trees was the finest forest in the Central Province, many of the "Doon" trees measuring *100 feet* without a branch. I was so enamoured of this forest land that I determined to try the *experiment* of planting coffee—although this was *the very first* idea of planting coffee in *forest land* at such an elevation, of over 3,000 feet. It was easy then to obtain land; the Governor gave *immediate possession* of 10 acres on which to form a nursery and put up 100 acres for sale at the upset price of 5s. an acre including survey fees *payable in 12 months*, and I obtained 100 acres on these terms—I had prepared a nursery of young plants, and my first cultivation was of *8 acres* and was certainly conducted in the most *thorough manner*.

I had only 3 or 4 of our old Kandyan labourers from Gampola. With the aid of an elephant I had all the land "*stocked up*" and the roots buried and the ashes distributed over the surface; the elephatn pushed down all the small trees with his head, and pulled up the roots with his trunk. The large timber trees being left, the surface of the ground was, I hear, reduced to a fine pulverized bed, like a garden—such as in future experience never was found necessary. The coffee trees were allowed to grow to the height of 5 feet; no roads or drains were necessary as all the rain that fell was quickly absorbed by the loose earth. I had a small picking of coffee in the second year which I sold in the island.

FIRST PREPARATION OF COFFEE IN PARCHMENT IN THE ISLAND.

Instructions in M. Laborie's old Treatise I could not obtain. What he designates as a *grater mill* I had at Gampola, two grooved cast iron cylinders of only 6 or 7 in diameter. I fitted these to work together and crushed out the cherry beans between them, and had a caned (rattened) sieve suspended below worked by a coolie. When the parchment

was separated from the pulp I put it to ferment in a cistern made for the purpose and dried it on mats; but leaving the dried parchment the difficulty was a substitute for a *peeling mill*, and I had to resort to the old paddy pounder; but had a winnowing machine from the old Gampola estate. I then had planks sawn of the keena tree and made into square boxes. These I lined with talipots to keep out the damp, and sent *my first crop* down to Colombo for shipment to Messrs. Price & Son this being the *first shipment* of Ceylon coffee consigned to them,—afterwards Price & Boustead. My total crop was cwt. 167 or just about cwt. *21 per acre* off my 8 acres. It sold in London for 108s per cwt. or a total of £670, which was just about *double* the amount of expenditure in the *purchase* of 105 acres of land the *cultivation* and *curing* of the coffee, erection of a shed in place of a store, and the building of a bungalow for my family in the hot season at a cost of £26. The heavy crop was doubtless owing to the high cultivation of the land, and the high price obtained was probably due to the fine greenish blue color of the bean similar to the mountain coffee of Jamaica.

The cultivation of the Black Forest Estate went on; additional land was purchased and it finally amounted to 260 acres of coffee when it was sold to the Venerable Archdeacon Glenie for Count Septimir, a friend of the Baron Delmar for the sum of £25,000.

The grooved new cylinder suggested the idea to Mr. John Brown, then engineer to Messrs. Worms, of the *Crusher* to be combined with the Pulper, which was afterwards found to work so well.

THE KEKUNA GRINDER.

It was supposed by Sir Edward Barnes that the kakuna nut which contains a large quantity of oil might be utilized as a *new product* from Ceylon in the manufacture of cotton cloths at Manchester and the experiment was tried, but the oil was rejected by the Trade, and the kekuna trees were found to be injurious to the coffee instead of being beneficial by their shade.

PERSONAL.

My object is not to write my personal history, but I may mention that when the Governor Sir Henry Ward gave the nomination of the member of the Legislative Council to the Planters' Association, I had the honour of being the *first elected* member and occupied that honourable position for about, seven years, and I was afterwards appointed by Sir Hercules Robinson as one of the Commissioners to report on the Military Expenditure of the island, the proceedings of which form a voluminous document in the annals of the Councils of Ceylon. My colleagues in this were Colonel Laffan, (R.E.) Major Skinner, Sir Charles Peter Layard, and others, and our report was received with favour.

I might take some credit to myself for having been the *first* to introduce or import *Indian coolies* to work on a Coffee Estate in Ceylon, but that this was dictated by self-interest. My Conductor at Black Forest was a man from Trincomalee, half Tamil and half Sinhalese, and I sent him to Trincomalee to obtain the services of a Tamil to go over to the Coast, to bring some coolies. My Sinhalese friends from Gampola having in the season their own work to attend to, my coast messenger in due course returned with 14 men from South India which formed the nucleus of the gangs which supplied the Black Forest Estate in after years, with 200 to 300 labourers, the descendants of whom have followed the fortunes of the Byrde family for the last 50 years, and I believe that some of the descendants of the same villagers are now with one of my sons at Awissawella, proving their faithfulness, so long as they are well treated and cared for.

Ceylon is so much indebted to, and dependent on labourers from Southern India, that planters have reaped the benefit and all friends of the Coffee enterprize have had full consideration for them which has been the *characteristic* of the treatment of the Coffee planters of my time, pre-eminently of our good friend Tytler at Pallakelly, and of that steady old Scotch planter of Mattakelle, our friend Mr. Smith.

ENGLISH EXPERIENCES.

After nearly 30 years of ups and downs in Ceylon, I took to English life. On my arrival in England, I was asked to take the command of a Corps of Volunteers which grew to a Battalion, of which I became the Lt.-Col., and when I retired, after a number of years of Command, I was appointed Hon. Col. of the 4th *V. Battalion South Wales Borderers*, which position, I have now the honour to fill. I was appointed J.P. for the County of Monmouth and subsequently Deputy Lieutenant for the County. I have been Chairman of the Pontypool Court for 27 years in which the trials number from 1,000 to 1,200 per annum. I have also been Chairman of the Pontypool U.S.A. Highway Board for a number of years, also of the Rural Sanitary and School Attendance Committees, and for the last 30 years a Commissioner of Inland Revenue.

On the County Council being formed I was elected a member representing 7 parishes, and became Chairman of the Asylum Committee of which I had been a member for 30 years, it belongs to 3 Counties and has about 1,000 members. I was appointed by the Quarter Session one of their Representatives on the Joint Police Committee.

But my own responsibilities, and our work prostrated me, and I have now been confined to my bed-room for the last 18 months; but by the mercy of Divine Providence, my health is now improving.

My experience as the first Coffee Planter on Black Forest land was in many respects quite unique and made me one of the Pioneers of that enterprise which raised Ceylon from a mere Civil Military Station to a Colony of European settlers and Colombo to a shipping port of the first importance.

Colonel Byrde was married at Cotta near Colombo on the 5th January 1837 to Rebecca daughter of Mr. Charles Mais of Bristol. After paying one or two visits to the old country, Mr. and Mrs. Byrde retired thither in the early sixties. In 1871 Col. Byrde paid his last visit to Ceylon, when he came out on business, and took back one of his grand-children with him—the eldest son of Mr. Charles Byrde of Amblangoda. The deceased lost tens of thousands of pounds in the downfall of coffee, but up to the last was interested in tea, owning, in conjunction with his youngest son, the Rev. R. A. Byrde, of Honiton, Devonshire, Honiton estate, in the Kelani Valley, besides being interested in other properties. In the fall of 1891, Mrs. Byrde, was so ill that the doctors thought that she would not last through the winter then approaching. Her devoted husband during that period was in attendance on her day and night, and her life was prolonged for two years. Col. Byrde, however, never recoverded his former robustness, and when his wife died on the 23rd of December, 1893, at the advanced age of 84, and he lost the partner of 57 years of his life, he felt the bereavement very much.

After his retirement to England, in the "sixties," Colonel Byrde made more than one visit to Ceylon connected with the settlement of his properties. These included, among others, a good deal of the land on which the famous Mariawatte Tea Garden is now situated; but as a coffee estate it was deemed of little or no value, the land being too flat and the soil too stiff: in tea it has proved a veritable gold mine.

Settling in Monmouthshire, Colonel Byrde became known as of "The Goytre" near Pontypool and made himself exceedingly useful in the neighbourhood and county. His loss was much regretted by his brother Magistrates and other county magnates as the following extracts from the Monmouth papers will show :—

THE LATE COLONEL BYRDE.

REFERENCES AT PONTYPOOL POLICE COURT.

Feeling references to the death of the late Colonel H. C. Byrde, D.L., the chairman of the Pontypool Bench of magistrates, were made at the Pontypool Police Court. Mr. C. J. Parkes (in the chair.)

The Chairman said: Before proceeding to the ordinary business of the Petty Sessions, I desire to refer to the very great loss which this division has sustained through the death of Colonel Byrde—one whose face was so familiar to this court, one whose urbanity, kindness, and courtesy endeared him to all who had the privilege of knowing him, and who knew how to appreciate his Christian and kindly character. I cannot sufficiently express the regret I feel personally at the loss of my old and valued friend. I feel that the loss to this division is one that cannot easily be replaced, and one that none of us can very well fill. I believe, further, that such a man as Colonel Byrde cannot pass from amongst us without its being a loss not only to this division but a loss to the county. I simple say that those who had the privilege of knowing him knew how to appreciate his singularly upright character, his love of justice, and his sympathy with the distressed; and it was always his anxiety to throw the shield of protection around the young and inexperienced, and occasionally to offer them more the advice of a father than of a magistrate presiding at this court. I beg to propose a vote of condolence with the family in what we feel is an irreparable loss, and ask our clerk to be kind enough to convey it.

Mr. H. Bythway: On behalf of the practitioners at this court. I would respectfully ask you to allow us to associate ourselves with the kind expressions to which you have given utterance. We cannot forget that as advocates in this court we received from Col. Byrde the utmost kindness and consideration, which were of the greatest assistance to us and were very much appreciated by us.

FUNERAL.

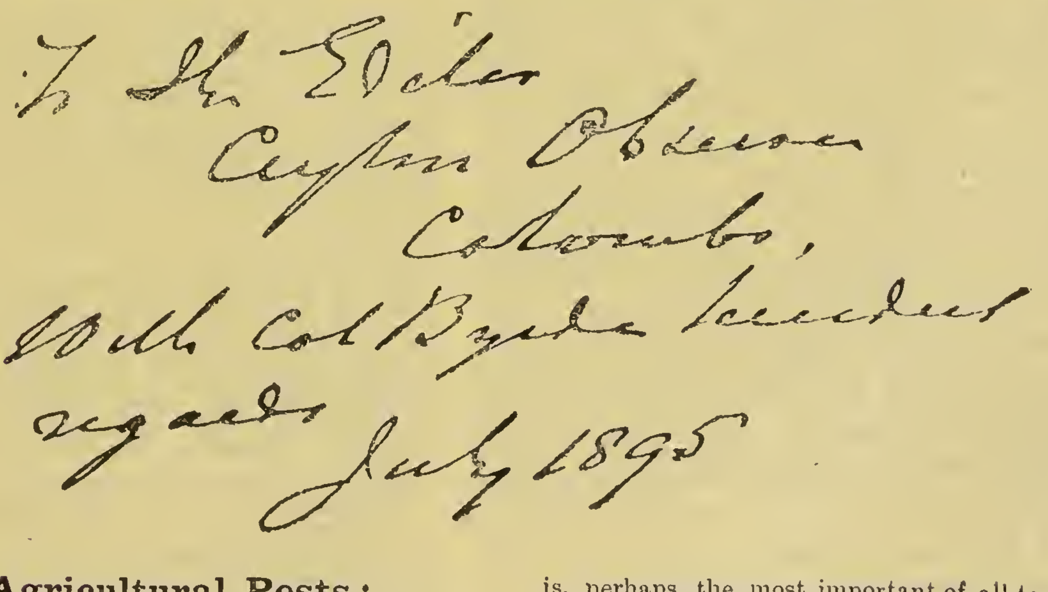
The funeral of tho deceased gentleman took place on Monday afternoon, his remains being laid to rest in the little "God's acre" attached to Goytrey parish church amid many circumstances which bore eloquent testimony to his private worth and public services. Seldom has such a large and representative assemblage been witnessed in the district. All classes of the community appeared to vie with each other to do honour to the memory of the departed gentleman; and the funeral afforded a striking illustration of the extraordinary influence which he had for many years exerted in relation to all institutions having for their object the social and moral elevation of the county. The mourning coach contained Miss A. Byrde (daughter), Miss L. Byrde (sister) and Mrs. R. Byrde and Mrs. C. Byrde (daughters-in-law.) The other relatives present included the Rev. F. L. Byrde, Keynsham (son), the Rev. R. Byrde, Honiton, (son); the Rev. H. Byrde, Broadwater, Sussex (grandson); and Mr. and Miss Dix, Mamhilad. The coffin, which was of polished oak with brass mountings, had an engraved breast plate—

Col H. C. Byrde.
Died Oct. 15, 1895.
Aged 79 years.

Colonel Byrde left five sons and a daughter—three are well-known in Ceylon : Col. Henry Byrde of Kandy ; Mr. Charles Byrde of Sinnegodde, Ambalangoda ; and Mr. Frank W. Byrde of Awissawella. In England one son, the Rev. R. Byrde, is headmaster of Honiton Grammar School, the other being chaplain of an asylum at Bristol.

We must hope to see the portrait of Col. H. C. Byrde—the first Planting Member of the Legislative Council—among the earliest placed on the walls of the new Hall of the Association when completed in Kandy.

(*Writing of Col. H. C. Byrde, No. 2, accompanying the notes of his career.*)



Agricultural Pests:

WITH METHODS OF PREVENTION.

BY MISS E. A. ORMEROD

(Late Consulting Entomologist to the Royal Agricultural Society of England).

(*Special for "Tropical Agriculturist."*)

III.

Beetles Injurious to Crops and Pastures.

From the fact of there being a very large number of different kinds of beetles (*Coleoptera*), and also from a great number of these injuring the crop, both in the grub, and in the beetle state, this order is, perhaps, the most important of all to the farmer.

For a long time "Ground Beetles" were supposed to live almost entirely on animal food, and, therefore, to help very much in keeping other insects in check; but now it is found that various kinds injure growing grain, seeds of grass, and other vegetables. In the United States it has been found, by watching the habits and examining the contents of different kinds of *Harpalus*, that these feed on rootlets, seeds, and other parts of grass or corn, besides other matters animal and vegetable. In Prof. Forbes' experiments it was found that of twenty-eight specimens of *Carabidæ* examined, twenty specimens, and these belonging to eleven species, had eaten vegetable food.

So far as I am aware, no further observations were recorded on the subject until about the end of the winter and early spring in the year 1888, when specimen of a grub, minutely resembling that of this species of Corn Ground Beetle, were forwarded to me as doing much mischief to young wheat plants in various parts of the south and east of England. In the summer of 1885 the night-feeding Ground Beetle, *Steropus madidus*, was sent me from near Bishop's Stortford, Herts, where specimens were captured in act of feeding on mangold roots. These beetles are partially carnivorous, as one of these forwarded to me killed one of its companions, and consumed its contents; but their field work, being about three in the morning, is seldom noticed. These observations make it very desirable to keep an eye to the habits of the many kinds of these pitchy or brownish "Ground" Beetles that we see so active in summer in corn-fields, and which have generally been supposed to be employed in clearing off insect vermin.

The second section, the *Brachelytra*, commonly called Rove Beetles, may be generally known by the short wing-cases, and, in the case of the very common beetles, sometimes known as Devil's Coach Horses, by their habit of arching up their tails when annoyed. Some feed on animal matter, including other living insects, and they much frequent rotten animal and vegetable matter. The grubs are very like those above described, but may be known by the fork above the tail being double-jointed, and furnished with stiff hairs. Both grubs and insects help us in clearing off other insect presence.

The third section is that of the *Necrophaga*, or *Clavicornes*, which includes beetles of very various habits, but for the most part feeding on decayed matter (especially the division often known as Sexton Beetles, which live for the most part in dead animals, carrion, and what we may shortly describe as "filth" generally). Their horns are usually enlarged or club-shaped towards the tip, or bent as if they had an elbow; and the wing-cases usually bend down at the sides, so as to cover the sides of the abdomen.

Some, like *Cadelle*, and the Corn *Cucujus*, are Corn feeders, and various kinds frequent flowers. Of these some species of *Meligethes*, or Turnip Flower Beetles, are very injurious, and furnish one of the few examples of infestations which may be satisfactorily lessened when established on the plant by remedial measures. The little green Meligethes Beetles may sometimes be found on the flowering shoots or rape, cabbage, and turnip, and cause great loss where the crops are being grown for seed.

The beetles feed on the pollen in the flowers, and lay their eggs in the unopened blossoms; the maggots from these feed in the bud and base of the flowers, and the seed pods. As a remedy it is found to answer well to have the infested tops and early blooms of the turnips picked, and put, with the beetles and maggots, into bags which are tied up as soon as full, and the contents destroyed. Under this treatment the growth of flowering shoots is much thickened, a great deal of the infestation is got rid of, and the crop is thrown back about a fortnight, which gives the rootlets increased time or action, and the plan is considered certainly beneficial in increase of crop, independently of clearing the insects.

The fourth section is the very important one of the *Lamellicornes* or Chafers. Some of these do us little harm, like the Stag Beetles, of which the grubs, so far as I am aware, live in rotten wood; or, again, the Click or Dor Beetles *(Geotrupidæ)*, which bore down into the ground, especially where droppings are lying in cattle pastures, and carry the dung into the soil as food for their grubs. But there are many kinds, such as the Small May-bug or Garden Chafer *(Anisoplia horticola)*, of which the grub does much harm in pasture land, together with another much rarer kind, (the *A. agricola*); also the Common Cockchafer, the Great Golden Chafer, and others which, in this country, feed, in the beetle state, on leaves of trees, or within flowers, and as grubs on the roots of grass, corn, or other ground crops, as well as trees; and, in the colonies, on the roots of coffee and sugar-cane, and altogether cause most serious loss.

The beetles are generally to be known by having a club of several leaves on their horns, such as the fan-like one that we see to the horn of the Cockchafer; and the grubs are large (sometimes as thick as the finger) and fleshy, with the end of the tail curved downwards and enlarged, as if it was swollen, so that the grub usually lies on its side. By this swollen tail and arched shape, and also by having three pairs of longish legs and strong jaws, you may commonly know the chafer grubs.

The habits of different kinds of chafers vary in such matters, as the depth to which the grubs bury themselves, or at which they turn to chrysalids, the length of time they pass in these two states, and also the time of day, or evening, when the beetles are at rest, which is a very important point in regard to getting rid of them; but the life-history of the common cockchafer gives a good general idea of that of the kinds that we are most troubled by. These beetles appear in early summer, and feed on leafage of many kinds of trees. The females lay their eggs in ground which is either cracked, or will allow of the female burrowing down into it to lay (the state and kind of ground is an important matter); she lays from twelve to as many as thirty eggs, from about four to eight inches deep. The grubs from these hatch in a few weeks, and feed on roots; maybe devastating young fir plantations, or attacking flax, or carrots, or many other crops, or ruining grass fields; there is a surprising variety in the kind of crop infested. After feeding for three or four years, they go as much as two feet or more down into the ground to turn to chrysalids, from which the beetles come up in the following summer, that is, the fourth (or, according to other opinions, the fifth) summer after they were hatched.

A great point is to keep the female from going down into the ground to lay her eggs. Sometimes, where the soil is of soft vegetable remains (as amongst the coffee plantations in Ceylon), it is found that laying a coat of the clay subsoil on the top answers; and, for field treatment, it has been advised to lay a good covering of some harder material, as marl or road-scrapings, on the surface, or to give a top-dressing of salt or gas-lime, or some application which might make the surface unsuitable for laying. Probably gas-lime would be very serviceable, and the washings down from this would be likely to drive any grubs near the surface away, for a time at least, and thus give the crop a respite. Gas-water applied at a strength which would not hurt the grass has been found to act well; the strength, of course, must be found by trial, as this varies much.

Where grubs are in unoccupied ground, that is, after the grass or crop has been killed or gathered, a great many may be got rid of by ploughing or digging deep enough to turn them up, and calling in the help of children to collect and destroy them, or that of the pigs, which will do much work without pay. The wild birds also, such as sea-gulls and rooks, should on no account be driven away.

There is, however, another treatment, not nearly enough thought of, which is applicable to all cases of infested land free of crop, and that is putting on a heavy killing dressing. Caustic gas-lime may thus be used, and alkali waste is excellent for the purpose. These are very much alike in their nature and effects; at first they destroy everything they touch, whether plant or insect, and the alkali waste is also used to clean the ground of deep-rooted weeds, such as couch-grass, coltsfoot, and thistles, and is washed down by rain into the soil, so as to make the drains run milky at a depth of three feet. This is procurable for little, if any, outlay, beyond cost of carriage from chemical works, where it is thrown out as waste. Now attention has been drawn to its value, and it is likely to be made available.

When it (or the gas-lime) has done its first work in the caustic state, the action of the air gradually turns the poisonous properties to sulphate of lime, and they become a good manure of the nature of gypsum.

If a heavy dressing of this kind was spread on land infested by any grub at the time when it is near the surface, and without disturbing the land, we should thus take it, as it were, unawares, and it would be destroyed by the poison before it had time to get out of the way, instead of, as is often the case, being merely made to go down to a safe depth, from which it presently comes up again to attack the new crop.

The fifth section of beetles belonging to the great division of the *Pentamera*, or those having customarily five joints to their feet (*tarsi*), is that of skip-jacks and their allies, scientifically the *Sternoxi*. These do little, if any, harm, in the beetle state, but in the grub-state—that is, as what we know as wireworms—the mischief and loss they cause to the country are beyond calculation.

The wireworms will feed on the roots of almost all crops excepting mustard, which they frequently have been found to avoid, and live for five years before they cease eating to turn to chrysalids, and thence to chick beetles. They are commonly of a yellowish colour, and take their name from their power of regaining their position when laid on their backs by a sudden jerk or skip up in the air, accompanied by a click.

The female beetle lays her eggs on, or a little below, the surface of the ground, amongst leafage or roots, and especially in such places as grass meadows, or clover leys where the surface is undisturbed for a time, possibly for years, and consequently the ground below swarms with wire-worms of all ages. When the pastures are broken up, these rough-skinned grubs are in no way hurt, but remain in the ground, ready to feed on each succeeding crop that is put in, until the time for their change comes.

Clover leys and pastures are the main starting-point of wireworm-attack to our field crops, and the method of treatment may be considered under the two heads: firstly, how to prevent egg-laying, and clear infected land, before re-cropping or sowing; secondly, how to lessen ravage, or support the plant under it, if wireworm is found present in the growing-crop.

To prevent egg-laying the ground should be made as unsuitable as it can be for the purpose. It is advised to feed down the grass as bare as possible before ploughing, or to go further, and pen sheep on it, gradually moving the hurdles forward, so that every part of the field may be thoroughly trodden. The sheep in this case are fed with turnips and other regular feeding stuffs, and the amount of liquid and other manure thus worked into the land thoroughly prevents the field being inviting for eggs to be laid on it, and destroyes any eggs that might be on the surface. Dressing pasture-land with lime brought fresh from the kiln, and spread hot so as to burn the grass, answers well. Sowing salt, at the rate of 5 to 8 cwt. per acre, on grass or ley before breaking up, has also been found to answer, and good dressings of caustic gas-lime, or of alkali waste strong enough to destroy all live matter on the surface, are very serviceable. Paring the surface, and collecting and burning the parings, gets rid of a deal of wireworm, if the burning is done whil t the wireworm is in it; and in any case gathering up the surface rubbish, and burning it, is useful as a preventive, for, even if the wireworm has left the locks of roots for a time, we thus get rid of the knotted lumps to which it would have presently returned, and which would have kept the land open for its passage.

The habit of the wireworm in feeding is to keep near the surface, gliding about, as its smooth glassy surface enables it to do, from one plant to another, eating out a piece here and a piece there, and thus injuring the whole crop; and, if this happens whilst the crop is in its first growth, the value even of those plants that struggle through is much lessened. For this reason the main points, in preparation of ground to carry the plant over attack, consist in treatment that will give a good seed-bed, and mixing the soil with such chemical manures as will be good for the plant and unsatisfactory at least to the wireworm; also so to clear the ground of rubbish and work it that it may be sufficiently firm (or admit of being sufficiently "firmed" by treatment afterwards) to prevent the travelling of the wireworm. For this purpose it is advised to plough in good time in autumn, and work the land well so as to get it in good order and consolidated, and either by burning, rotting, or whatever means may be preferred, prevent it being kept open and full of harbours for wireworms; stubble and roots, cabbage stalks or beanhaulm, and all such matters, are wireworm-helpers. If we took down the notes of special applications found serviceable to plough in, we see constantly repeated: salt, salt, salt, gas-lime, gas-lime, hot lime, lime and salt; and in a less degree (probably because it is not so well-known) alkali waste is also highly recommended. Kainite also is useful, and regular fertilisers, as superphosphate and nitrate of soda. But it is worth notice, especially in preparation of ground for turnips, that there is a great doubt whether wireworm is not often encouraged by the use of farm manure. The wireworms of two of the commonest kinds of click beetle have been found respectively in dung, and in well-rotted horse dung. It is considered by some farmers that crops so manured are the most infested, and if we consider that in this manure a large portion of the material is still unchanged vegetable matter, of much the same kind as wireworms would naturally feed on, it gives a reason for attention to this point. Thorough salting of farm manure has been advised to get over this difficulty. It should also be remembered that heaps of decayed turf are headquarters of wireworm, unless treated with caustic lime, salt, or the like dressings; also that (take what pains we will) if grass headlands or grass strips are left across or by our fields, there we make homes for the wireworms, and they will add all requisite confortable provision from our crops. The only crop which wireworm appears to have customarily a great objection to is mustard. This, therefore, is sometimes useful as a cleaning crop.

When wireworm is present, strong fertilisers—such as nitrate of soda, guano, superphosphate, or others—are serviceable; and mechanical means, such as heavy rolling, are of use, for thus the creature is prevented travelling, and some of the pests are probably set fast and killed. Treading by sheep or cattle, or by the heavy iron-shod feet of horses, similarly firms the soil serviceably. The wireworm can be drawn away from the attacked plants by dressings of rape-cake or Indian rape, that is, mustard-cake, and in the latter case has been found by experiment to perish in about a fortnight where it had no other food, and, connecting this with the power of mustard as a cleaning crop, it suggests that further experiment would be useful.

These are some of the main points of wireworm prevention:—Prevent egg-laying; clear the ground of wireworm, and get a good start for the plant; keep up the strength of the plant under attack, and keep the power of the wireworm in check; and also do not dress your land with wireworm, either in decayed turf, or by letting grass homes for it be amongst your crops. The subject is o e of great importance.

AGRICULTURE IN THE ALPES MARITIMES.

The visitor who goes to the Riviera in search of health or pleasure during the winter months, and who confines himself to the fashionable towns on the coast, would not be inclined at first sight to consider the department of the Maritime Alpes as an agricultural district. It is, however, strictly one of the agricultural departments of France. There are few manufactures. The most important are the perfumery

factories of Grasse, which consume a great quantity of cultivated and wild flowers, as well as aromatic plants grown on the coast, and among the mountains of the department. The Acting British Consul at Nice, in his last report, states that the department contains 373,800 hectares (hectare= 2·47 acres), of which 73,764 hectares are ploughed land, 61,411 hectares are planted in vines, 19,513 hectares in timber, 20,774 hectares are meadows, and 90,000 hectares grazing ground, or "Alpes;" of the remaining territory, 55,942 hectares are built over, or used for roads and ways of communication, while 52,363 hectares are uncultivated, or barren. The soil is naturally fertile, and produces well where it can be irrigated by means of the canals. A great deal of the cultivation is done on the terraces made on the mountain sides, every kind of crop being grown on them, from olives to cereals. Wheat, meslin, rye, barley, and oats are grown, but not to any very great extent. In 1894, 20,941 hectares out of 61,414 hectares planted in vines, gave 36,298 litres of wine, as against an average of 49,092 litres. The wine produced 1895 was very abundant, but not of such good quality as vintage of 1894. The wines, as a rule, inferior, but near Bellet they make a wine which some consider excellent. Besides the wine grown in the country, and the *vins fins* imported for the consumption of the well-to-do classes and foreign visitors, large quantities of inferior wines are imported from Spain and Algeria into Nice, Cannes, Antibes, and Mentone. These wines are often doctored, and generally are what is termed *platré*, and are not very wholesome. There is more wine drunk per head of the population in Nice than in any town of France. Market gardening is carried on chiefly near Nice, towards the Var, at St. Laurent-du-Var, Cagnes, Antibes, Vallauris, and Cannes. Some of the gardeners make a specialty of *primeurs* for the London and Paris markets. At Nice there is a trade in dried vegetables. These, as well as candied fruits, are largely sent to Bordeaux, from whence they are exported to England. Fruit culture has made great strides of late years, owing to the extension of the candied fruit trade. Among the fruit trees whose cultivation can be considered of the first importance come the peach, the fig, the plum, cherry, orange, and, at Mentone, the lemon. The olive tree of the Riviera is cultivated for its oil. The dry and calcareous nature of the soil being admirably suited to the cultivation of the peach, the *Persica Amsden Fune*, a native of the United States, is successfully grown in the open air, the fruit ripening from about June 1 to June 10; the peach tree suffers principally from the presence of ants. The fig tree is much cultivated in the depart-ment, and its fruit is both sold fresh in the market, or candied and dried. The dried figs of Nice are consumed locally. Three lb. of fresh figs give one lb. of dried figs. Dried figs of prime quality fetch from 40 to 60 francs the 100 kilogrammes. The Arabs of Algeria manufacture a kind of spirit, known as *Araki*, from the dried figs, and the peasantry of Nice and the Genoese Riviera make a kind of sweet wine from this fruit. The tree gives two crops every year. It requires careful cultivation, and to be judiciously cut. Like all other fruit trees in the Riviera, the fig suffers greatly from insects. Cherries are very plentiful, and the fruit is largely used locally in the manufacture of bonbons, preserved in brandy and candied. The crop has not been so good this year as in 1895 or 1894. Orange and lemon trees are largely cultivated all over the coast districts; besides the climate, the soil is very favourable to these trees, as they require a calcareous one, rich in lime and potassium. They generally die, if the temperature falls below 23° Fahrenheit. The common orange tree, cultivated at and near Nice (the *Citrus aurantium*), produces its maximum at about 20 years of age. This may be calculated at 600 to 1,000 oranges per annum, 1,000 oranges weighing about 150 kilo-grammes. They are, however, principally cultivated for their flowers, which are sold at 40 centimos per kilogramme, or about twopence per lb. With the skins of the orange an essential oil is made, both at Nice and Grasse, which is called essence de Portugal. The bitter orange tree, or *Citrus Bigardia*, is cultivated for its flowers, which produce a kind of water much used in France called *eau de fleur d' orange*, and also an essence The skins of these oranges are dried in the sun, and are exported to England, where they are used for making cakes and puddings. Dr. Emile Sauvaigo, in his book, "Les Cultures sur le Littoral Méditerranéan," estimates that the average annual income in the Alpes Maritmes derived from the cultivation of the olive, is £320,000. In spite of this, the cultivation is on the decline. Dr. Sauvaigo gives the following reasons for this—"The competition of grain oils, such as cotton seed, &c., and the numerous frauds and adulterations practised in the olive oil trade, and besides these there are the dearness of labour, faulty pruning and insufficient, manuring, and last, but not least, the increase of the parasites of the olive tree." The tree growe best on slopes, and prefers a dry soil, rich in carbonates of potassium, lime, and magnesia. It suffers from cold, and dies at 14° Fahrenheit. On the Riviera, a tree planted from a seed begins to bear fruit in about 13 to 14 years, and those planted from cuttings in about 8 years. It flowers in April. In August, when the fruit is well-formed, it suffers most from its enemy the *Keiroun*. One of the most difficult things in olive culture is the pruning of the trees, and this has to be done as soon as the crop has been gathered, or after severe cold weather. As regards reproduction (and this, says Consul Jerome, may be of special interest, as on one or two occasions the consulate has been asked by the London representatives of Colonial Government to obtain seeds and young grafted olive plants, to be sent to the Colonies for plantation), this is effected, first by seeds. The ripest and finest olives are chosen, the stones are separated from the pulp, and they are spread out to dry in the autumn, and planted in the spring. They take about a year to come up, but if the stones are broken, without any damage being done to the kernels, and by sowing these in February or March, the young plant makes its appearance much sooner. The seedlings, after having been kept in a nursery garden for about four years are grafted. Dr. Sauvaigo recommends graftings on the wild olive (oleaster), or on suckers, and these should be chosen as far from the parent tree as possible. Olive trees are also reproduced from cuttings. In all cases care must be exercised that the young plants should be taken from the nurseries just before winter or the rainy season, so that they should benefi by the natural moisture of the soil. The crop is gathered by women and children at the rate of 1 franc to 1 franc 50 centimes per day. The fallen fruit is picked up under the trees during the winter, and in April or May the trees are beaten. If the olives cannot be imme-diately taken to the mill, they are stored in heaps, which have to be stirred to prevent fermentation. The olives are usually sold to the manufactures of olive oil, at the rate of from two to four francs the double décalitre (20 litres), according to the quality. The oil produced at the mill can be divided into several kinds:—(1) Virgin oil, or the oil pressed out and carefully filtered several times; (2) the first quality oil of commerce, or the oil scalded in vats, which is a much quicker process, but somewhat spoils the quality of the oil; (3) *Huile de ressence*, or refuse oil, used as a rude soft of lubricator oil by the peasantry. An olive orchard brings in an average income of £20 per annum for each hectare, and the land is valued at from £200 to £480 per hectare. The diseases the tree suffers from are numerous, the most formidable being known in the district as *la fumagine*, caused by a small fungus. The mills where the olive oil is made are, as far as machinery goes, of a very primitive character, generally driven by water wheels. These are defective in construc-tion, and the fall of the water badly arranged. The machinery inside the mills is made of clumsy wooden cogs and contrivances. Consul Jerome says he is sure that improved machinery for making olive oil would find a ready sale in the South of France and Italy, providing that it was not of too complicated or expensive a character.—*Journal of the Society of Arts.*

CEYLON EXPORTS OF COCONUT PRODUCTS:

THE SPREAD OF THE PALM-GROWING INDUSTRY.

The revised table of exports, as amended by the Chamber of Commerce, which we give as a *Supplement* to this issue, throws some light on the position and the development, in some directions, of the Coconut Palm Industry within the last 10 years. It is still a native industry, in the sense that it is chiefly in the hands of natives, just as tea planting is chiefly in the hands of Europeans. The *Tropical Agriculturist* was among the first to counsel the encouragement of natives to plant up their little ex-coffee patches with tea, and it had to face not a little ridicule and impotent snarling in this matter, as in its agitation for Railway Extension, before men saw that there was room for both European and native in tea cultivation and manufacture and that there were many conditions favourable to the growth of the industry in native hands. At the present day, it is not in little patches only that our native friends are interested, but in extensive blocks as well, both on the hills and in the low-country. What we looked to specially was a very considerable and yearly increasing local consumption of tea. In old days we reckoned that 50,000 cwt. of coffee were used by the people of Ceylon and we do not see why we should not have a native consumption of tea equal to several millions of lb. a year before long.

If Ceylonese of all classes are becoming alive to the profits derivable from the tea industry, not less marked is the confidence which European capitalists at home, and hard-headed colonists on the spot, are showing in the old coconut industry. It would be a great mistake to suppose that European capital never found an investment in palm culture till of recent years. When coffee was the rage in the mountain zone, the palm groves of the Northern and Eastern provinces attracted not a few Europeans. Their experience, aggravated by difficulties of transport, was not very encouraging; and the minimum of profit with the maximum of waiting did not help the industry in competition with products from which quick, and for a time large, returns supplied the precise conditions which prove attractive to strangers in a strange land. The European looked askance at coconuts, and we doubt whether a single agency firm had a single coconut estate on its books 20 to 30 years ago, or was prepared to make or sanction, an advance on coconut property. All that is changed now; and one of our largest and most uniformly successful Tea Companies set a striking example a few years ago by investing its reserve fund, or a good part of it, in coconut plantations. Since then the confidence in coconuts as a safe investment, yielding by no means insignificant returns, has grown; and we hear of extensive tracts being opened up for coconuts by European firms and Companies, while a larger number of proprietors are combining tea and coconut culture in the same fields, with, in some cases, encouraging results, though in others we have heard fears expressed that the one product interferes with other. Indeed, it is evident, that the shrub, hardy though it is, will have ultimately to yield to the great umbrageous tree with its matted network of roots; but not, we trust, before the enterprising proprietors are assured of a return from coconuts, hastened by the cultivation of the tea, sufficient to compensate for the diminution, or the stoppage, of the income from tea. Meanwhile, there is a brisk demand for good nuts from selectd trees for nurseries on lowcountry and upcountry estates—up to almost 2,000 feet in elevation; and we learn from a Veyangoda proprietor that scarcely a month passes without his having to despatch seed nuts from his estate on orders by cart or rail.

Though the cultivation of this most useful palm is yet, and probably always will be, chiefly in native hands, the development of the industry is principally due to European enterprise and capital. Coconut oil mills first encouraged the extension of plantations, as their voracious maw began to demand far larger feeds of copra, than the slow and primitive checkoo; and now the desiccating mills, also the outcome of the inventive genius and restless enterprise of European capitalists, are again stimulating the demand for nuts, which had slackened somewhat, through new illuminants, lubricants and fatty substances necessary in soap-manufacture competing with, or elbowing out the oil from some of its old markets. We thus fail to note any actual growth in coconut oil exports. Last year they amounted only to 343,000 cwt.—positively the lowest figure for the decade, if we except 1887, which showed a falling-off as compared with some earlier years; while in 1892 the exports ran as high as 550,000 cwt. The difference of 217,000 cwt —an average year's exports—represents at 500 nuts to the cwt, about 108½ million nuts; and our readers can understand what a rundown in the price of nuts this slackened demand for oil would have involved, were it not for the Desiccating Mills which have continued to absorb a growing quantity of nuts, year after year, if we except 1894, when there was a temporary falling-off caused it is believed, by slackening work in the Mills to discourage competitors. The first record of the desiccating business is to be found in the Export figures for 1891 when 416,330 lbs. were exported. The next year there was a leap up to over 3 million lbs; in 1893 over 6 million; while in 1896 we exported over 10 million lb. of Desiccated Coconuts, representing at 3 nuts to the lb., no less than 30 million nuts! We have seen that the difference in the outturn of oil between 1892 and 1896 represents a difference of 108½ million nuts. Now, the difference in the desiccating business of the two years, accounts only for 7 million lb., or 21 million nuts; so that last year is to the bad, as compared with 1892, to the extent of 87½ million nuts. It is no wonder that the price of nuts has receded this year and is lower than it has been for three years back. It will not, indeed, be safe to expect higher prices until the demand for oil has quickened. The shipment of unmanufactured nuts, last year, shows a considerable increase over that of 1895—as much as 3 million nuts; but a total of 13 million nuts exported, though the highest on record, cannot count for much in considering the shrinkage of oil. Still the demand for shipment and for desiccating purposes helps to keep up prices on the seaborde and in the districts surrounding the Mills; while another element in the calculation is the increased demand for culinary purposes, which grows with the growth of population and specially with the growth of general prosperity. We suppose the better part of the nuts exported finds its way into the coconut butter business. Of Copra, or the dried kernel of the nut, 50,000 cwts. were exported. The figures, though better than for the three years preceding are not to be compared with those of some years ago. Within the past decade the

exports ran into six figures on four occasions, and on every one of these, the exports were more than double those for 1896, and almost treble! So that in that direction too, there is little ground for satisfaction. Of Poonac an average quantity was exported in 1896, though less than for the previous six years, in natural correspondence with the diminished outturn of oil. But we never lament a falling-off in poonac exports, as the more of it we retain for feeding stock and for manure, the better. The Coir business—whether in rope, yarn or fibre—was an average one, and from all accounts the trade in these articles has been overdone, and the profits desirable from them are not very dazzling. Altogether, Coconuts have not shown up as well last year as the year before; and the slack demand for oil in European and American markets must tell to some extent on business this year, until a brisker demand springs up, and Indian competition begins to tell.

PRODUCE AND PLANTING.

TEA IN THE UNITED STATES.—The difficulties of pushing Indian and Ceylon tea successfully in the United States are well-known. It requires plenty of pluck and perseverance. The following letter from the Philadelphia correspondent of the *Grocer* is of interest as showing the state of the tea trade. Writing of that portion of the city where the relics of the Revolutionary period most abound, the correspondent says: "In this section of the city are many tea importers and jobbers, some being the largest in the United States. One firm reports sales in a private way of 88,000 half-chests in ninety days, an exceptionally large distribution for a firm in this country where tea is not in popular favour. Most of this tea was sold by travellers who go as far west as the Rocky Mountains. This house does not speak enthusiastically of the prospects of Ceylon and Indian teas, because their flavour is so different from the green tea and Oolongs in favour here for 125 years. On the other hand, I found those who think that Ceylon and Indian teas are the teas of the future. They are certainly very much in evidence at the Food Show now being held under the auspices of the Philadelphia Retail Grocers' Association. I found that the main exhibit was by the Ceylon and Indian tea interests. A very large space has been fitted as a tropical tea garden wherein maidens passably fair invite you to tarry and sup. You are served, as you elect, with a cup of hot or cold tea, together with a biscuit. Upon conversing with the manager, I found him quite an enthusiastic American advocate of Ceylon tea. He states that the greatest drawback is that consumers are not careful in brewing, as they use as great a quantity of Ceylon or Indian tea as of the China or Japan sorts, and the result is a very heavy-bodied liquor, sweetish and with too much tannin. It is to overcome this fault that demonstrations in the proper use of Ceylon and Indian tea are given. Tetley's teas were represented in a separate pavilion, where consumers could also obtain a cup of the delicious beverage, and go away provided with a beautiful lithographed *brochure*, somewhat humorous in character, but of a kind to provoke the recipient to carry it home and preserve it for amusement and reference."

WHAT THE AMERICANS DRINK.—"The Americans are not given to tea-drinking. They go in for coffee and beer, using both very freely—about nine pounds of coffee and sixteen gallons of beer *per capita*, while of tea they use about one and a third pounds. It is seldom I have found a cup of tea decently brewed, except when made to order in some first-class hotel or famous restaurant. Certainly, 70,000,000 consumers, with tastes varying greatly, offer a fair field for the push, pluck, and persistency of the Ceylon and Indian tea people. Everywhere I find photographs of scenes in the tea-gardens of Ceylon, and others illustrating methods of manufacture. All of this is calculated to make a bigger demand for machine-made tea. I was also presented with a private statement of the position of tea, prepared by one of the oldest firms of brokers in the land. It shows an estimated supply for the season of 1896 and 1897 of 82,350,000lb. against 105,300,581lb; in 1895-96. The supply is made up as follows:—Green tea 14,000,000lb; Japan, 40,000,000lb; Formosa Oolong, 16,000,000lb; Amoy Oolong, 1,250,000lb; Foochow Oolong, 3,600,000lb; Congou, 7,500,000lb; total, 82,350,000."

BRAZILIAN COFFEE.—An important sale of Brazilian coffee on spot took place at Hamburg on Thursday week, 24,000 bags, mostly Santos, lying in steamer now in port, being disposed of by the banking house of L. Behrins and Sons. The buyers were local firms. There is reason to believe that this coffee was a consignment made by the Brazilan Government, in place of bills in discharge of amount required for payment of interest on Brazilian bonds. The coffee was consigned to Messrs. Rothschild in London, who had it sold in Hamburg.

COFFEE IN 1896.—In the coffee market values receded from 77s to 62s in August for ordinary Colombian, while middling sorts of other Central American moved from 94s to 85s. East Indian fell proportionately for the common and pale kinds, and Bahia, African, and Santos dropped about 25s, 50s being touched for good average Santos, while, on the other hand, good to fine qualities have, with slight fluctuations, maintained very full rates. One noteworthy feature was that when suppli s were at the heaviest prices were relatively high, as both dealers here and on the Continent had run their stocks so low that they were compelled to buy. After they had filled their requirements prices gradually declined, and with heavy Brazil receipts pointing to a large crop the downward movement became more pronounced. In August, however, when supplies had fallen off and demand became more active, values recovered 4s to 6s. Towards the close, with supplies of new Colombian coming forward rather freely, prices again gave way slightly. Ceylon, in consequence of leaf disease and the gradual decadence of cultivation, has been in small supply and commanded extreme prices A parcel of native, the first seen for many years, brought full rates. East India, considering the quality, which was not altogether up to the usual standard, averaged well. Costa Rica has been in larger supply, and quality generally was better, especially fine marks. Offerings of Nyasaland (grown from Indian seed) have increased and high prices were realised. The growth, being of good colour and make, promises to rank well with other descriptions in the favour of the trade, but so far the parcels have been very mixed with defective berries, showing the necessity for more thorough hand-picking. In the terminal market business has ruled exceptionally quiet, even the change altering the minimum quantity dealt in from 500 to 250 bags failing to stimulate speculation, but during the latter part of the year there has been a little more doing in Santos futures. Prices have steadily declined, good average Santos being quoted 70s in the beginning of January and closing at 50s, after having been as low as 47s 6d. Fair Channel Rio, opening at 61s 9d, is now 48s, having been as low as 43s in the beginning of October.

COCOA DURING 1896.—Cocoa experienced unexampled depression during the greater part of the year. For the first six months supplies poured into the Port of London to such an extent that the accumulated stock in bond was about double the average stock of the last ten years. Manufacturers were consequently able to purchase on their own terms, and values gradually declined until the lowest level ever recorded was reached. For in-

stance, Trinidad cocoa became a complete drug in the market, so much so that the principal buyers of this description refrained from purchasing for nearly half the year, and to effect sales importers had to accept a very considerable reduction, values for the first time sinking below those for the produce of neighbouring islands. Some relief was experienced during the latter portion of the year, this being caused by a shortage from Ecuador, which country continues to be the principal source of tho worl l's production. Notwithstanding an increased acreage under cultivation in that country, the total crops, after a record yield in 1893, have yearly diminished. Other sources of supply, such as Ceylon, St. Thomé and Brazil, produced average quantities. The lessened yield from Ecuador caused a rapid falling off in the accummulated stocks, which at the present moment have sunk below those of the corresponding period of last year. At the later sales of the year a better demand was apparent, and prices of some growths showed a tangible recovery. It is worth noting that a considerable reduction in prices made by German manufacturers caused an immediate and important increase in consumption amounting to 40 per cent in the short space of two years, as is shown by the official duty payments. The principal English manufacturers retain practically the high prices based on the values of the raw product of years gone by, consequently no increase can be seen in the consumption of the United Kingdom. A feature of the year and an object lesson to home manufacturers was the inclusion in auction of considerable quantities of German and Dutch prepared cocoa, which, notwithstanding an extra duty, was sold at price greatly below those of English makers.—*H. and C. Mail*, Jan. 8.

CEYLON TEA IN 1896.

Messrs. Tudor, GoodLiffe, and Co. in their Report for 1896, say :—

Ceylon Tea.—Ceylon tea has during the year marked a further advance in popularity, both deliveries and production showing an increase on the previous year. Tho colonies and other countries have drawn rather larger supplies direct, and Russian demand has now become such an established factor on our market that many lots of fine quality Pekoes are now placed beyond the reach of home trade buyers. Unfortunately, however, the bulk of last year's import leaves much to be desired in both leaf and liquor, some of the shipments reflecting little credit on their manufacture. The crop, generally, ruled thin and poor, with a low average of prices, quality often being sacrificed to quantity, although any invoices possessing strength and flavour always commanded good prices and brisk competition. The trade has received little encouragement even to buy beyond immediate requirements, no improvement being noticeable in the retentive properties, and rapid deterioration in quality has as usual often deprived holders of any benefit arising from a harder market. Broken Pekoes have been in abnormally largo supply, and as leaf is becoming more in request for packing purposes, the former have marked a declining demand. Prices have ranged from 4d up to about 1s 8d. All grades have been comparatively cheap throughout the year, except when affected by the dearer Indian market in the spring, and buyers have generally been able to obtain a fair supply of leaf under 6d, —*H. and C. Mail.*

THE FINANCIAL PRESS ON THE TEA INDUSTRY AND TEA SHARES.

The position of the tea industry is frequently commented by on the several financial papers, and these comments are, as a rule, very favourable. We append recent extracts from the *Financial News* and the *Financial Times* :—

The "Financial News."

One of the features of last year was the increased attention paid to investments in tea companies, and it seems fully justified by the statistics that are to hand. In 1895-96 the Indian output reached 146,000,000 lb, against 136,000,000 lb in the previous year, and that of Ceylon 106,000,000 lb, against 98,000,000 lb. Consumption, however, very nearly kept pace with the larger production, for the home market absorbed 201,000,000 lb of British-grown tea, against 190,000,000 lb in 1895, and foreign markets took 42,000,000 lb, an increase 5,000,000 lb over 1895. The consumption of China tea, on the other hand, decreased from 26,000,000 in 1895 to 20,000,000 lb last year, and the percentage of China to the other teas has now fallen to nine, which compares with 54 for Indian, 35 for Ceylon, and two Java, etc.

The "Financial Times."

We have referred to experts with regard to the outlook, and we find them agreed in endorsing this view. Taking the question on the broadest lines, we do not find that great improvements in dividend are to be looked for in the near future, but it is thought that there is a reasonable prospect of the present rates distribution being maintained. If such a view be correct, it is quite clear that tea company shares, considering the large yields they give at present, must tend to increase in market value, independently of any increase in the dividend. The returns to purchasers at present prices are, on the basis of recent dividends, of the kind which one only looks for on highly speculative investments. If those recent dividends turn out to be, on the average, stable, there is obviously a margin for a moderate improvement in prices, and tea shares will go into a higher category in the classification of market securities. A consideration which has adversely affected their market valuo hitherto is the limited character of the market, and this disadvantage still prevails to a considerable extent. In view of that fact, it will not be amiss to give a word or two of advice and explanation to readers who contemplate investment in tea companies' shares. It may appear paradoxical to recommend purchases of individual shares when the market in them is depressed; but, nevertheless, it is the sound policy under the present circumstances of a limited market, mostly conducted by means of negotiation, and not, as on the Stock Exchange, by a free quotation. On such a limited market the seller even of a few shares may very probably depress the quotation to an abnormal extent. This is the buyer's opportunity; and the converse applies to the seller. While the market is developing we should advice both buyers and sellers, in tho first place, to satisfy themselves as far as possible regarding the instrinsic merits of tho company whose shares they propose buying; in the second place, to see that they buy at reasonable prices, and not on the top of a rise, brought about by some fortuitous circumstances; and in the third and last place, we would commend to their notice the mixed metaphorical advice, conveyed to us for the benefit of our readers by one who knows as much about this market as anybody does: "Don't put all your eggs into one teapot." In other words, while believing in the hopeful character of the outlook, he recognises the speculative nature of the industry, and would not recommend pinning one's faith upon any individual company. The prospects as regards the working for 1896 are that they will probably be better than for 1895, which was a lean year, but that they will not be so good as those for 1894, when the success was phenomenal.

There has been a good deal of talk about the danger of over-production. That is a matter which will one of these days have to be seriously faced. But at present it is not a thing to arouse concern. The experience of tea-growers has been that increased production has far created fresh outlets, notably in Australian colonies, Canada, the United States, and, to a lesser degree, the European con-

tinent. This is due to the increasing activity shown in pushing trade by the planting community and by the Mincing Lane traders. While undoubtedly the risks attending on a tea-planting business are great, there is this point to be noted—that the sales of the produce are not regulated by speculative market conditions to anything like the same extent as prevails with regard to nearly every other class of produce. It is, we believe, the fact that seventy to eighty per cent. of the tea grown is shipped home to be sold at current market prices on account of the producer, whether that producer be a private person or a public company. There is no organised speculative market such as exists with regard to wheat, for instance. To all intents, we may say that the produce is sold by auction. It is not held up at a price to prohibit or curtail the normal demands of customers. There is another check to overproduction in the limited supply of labour. The coolies gravitate to the old-established fields, because, amongst other things, there is on htese much less danger of fever and other diseases arising from the miasma so prevalent in the jungle until an estate has been opened up. Consequently, competitors to those old-established companies are handicapped by the difficulty of getting suitable labour. In various parts of the world attempts have been made to compete with Indian and Chinese tea, but they have not come to anything; beyond that comparatively restricted tea-producing districts in Central Ceylon, no other substantial production threatens, unless, perhaps from Java, whose produce goes almost entirely to Holland. Attempts have been made in Natal to grow tea, and these may ultimately come to something. But even so, all that she could produce would be absorbed in South Africa itself, and the chief markets of the world would still be left to the Eastern tea-producers. In Virginia, in the Caucasus, and latterly in Brazil, efforts at tea-growing have been made, but the results have not been such as to cause alarm to the Indian tea-growers. Taking everything into consideration, therefore including the large yield at present obtainable, Indian tea shares promise well to the discreet investor who recognises the fact that the present limitations of the market may prevent a sale at an exact moment. He must lay his account for ups and downs in prices, but the market in tea shares is daily becoming more free, and this, as also the rise in prices of shares, is largely attributable to the recent consolidation and amalgamation of companies engaged in the business. There are fewer companies now than a year ago, but their several capitals being larger, their shares are more readily marketable, and the members of the Stock Exchange who deal in such shares are in close touch with the outside merchants, who devote to them their special attention.

NEW COFFEE FIELDS IN COLOMBIA.

I have the honor to forward an account of the new coffee country of the Sierra Nevadas of Santa Marta. It has been found that coffee does well in that section, and large tracts of land are being secured for plantations. I am indebted to William Crane, Esq., an American now growing coffee in the Sierras, for much of the information.

Until two or three years ago, the Sierra Nevada mountains, whose snow crowned summits are the first to meet the gaze of the traveller hitherward, had invited in vain the explorer, the miner, and the botanist; and the scanty knowledge of them gained by the Spaniards, in unsuccessful attempts to subdue their aboriginal inhabitants, had been forgotten.

At last, three hundred and sixty years after the settlement of Europeans upon these shores, the inhabitants are awakening to the fact that at their doors lies one of the most-favored districts of South America for the cultivation of coffee.

For many years, coffee has been grown in the interior departments, notably Santander, Cundinamarca, the Tolima, and its export from these departments has steadily increased for fifteen years, but the difficulties in the way of getting the crop to tide water or to a navigable stream have been a serious deterrent to a general development of the regions adapted to coffee culture.

The cost of carriage for several days' journey upon pack mules to reach the Magdalena river or some tributary, navigable only by rafts or canoes, and the loss and damage suffered in transit, have made such inroads into the profits that would otherwise result from its production that, although the coffee is of a high grade, little attention was paid to its cultivation until the sudden collapse fo the market for cinchona bark drew the attention of commerce to coffee as the most available article of exchange for foreign importations.

Some effort has been made toward the improvement of transportation, many concessions have been granted for railway, and vast sums wasted in subsidies; but no considerable betterment is noticeable in the means of land or water carriage over those of a quarter of a century ago.

In the latter years of the last century, a single small plantation of coffee was established on the northern slope of the foothills of the Sierra Nevada, but was abandoned for two generations, on account of the low prices and small demand for coffee of that time. This and a few small plantations in the lowlands were all that saved the entire region from being an unbroken wilderness.

The favourable reports of a few lookers about who have explored this range or rather group, of mountains have attracted attention, and, latterly, beginnings have been made upon a dozen or more plantations, chiefly within a radius of as many miles from Santa Marta.

The conditions of soil, temperature, rainfall, and available water power can hardly be surpassed. While the greater part of the section is composed of slopes of greater or less steepness, little of it is so steep as to be unavailable for planting, and there are frequent intervals and high table-lands of considerable extent.

At a height of 2,500 ft., the mean temperature is 70° F., 80° and 60° being the maximum and minimum throughout the year. The climate is salubrious, and the European can perform a full day's labor without undue fatige. All the vegetables and many of the fruits of the temperate zone flourish. Upon the northern and north-western slopes, coffee is found growing wild in considerable tracts of the forest.

The supply of young plants in such profusion is of great vaue in the making of a plantation, shortening by a year or more the time which would otherwise elapse before a crop could be produced.

But perhaps the most important advantage which this region presents is its nearness to the excellent harbor of Santa Marta, to which port the product of plantations can be carried at trifling expense, and with no risk of loss or damage. Santa Marta is a port of call for several lines of steamers, besides a regular trimonthly service of fruit steamers, soon to be made weekly.

While considerable tracts of the land near the port have been taken up, there still are hundreds of square miles of the public domain well adapted for coffee planting; and the land laws of the republic are very liberal, offering equal conditions to native and foreign settlers.

The quality of coffee grown here is fully equal to the best grades produced in the country, and as an indication of the duration of a plantation, the old plantation, before mentioned may be cited, for, although no care and but trifling expense have been bestowed upon it during at least half a century, the present owner still gathers from the portions not smothered entirely by forest growth, enough fruit to give him a profit over maintenance of plant, while employing only the most antiquated and crudest methods of preparing the crop for market.

JOHN BIDLAKE, Consul,

Barranquilla, June 5, 1896.

—*Rio News*, Dec. 15.

RHEA: A NEW FIBRE.

How many bankruptcies does it take to establish a new industry? British manufacturers are by all accounts among the most conservative of mankind, and if the name "ramie" suggests anything to a Lancashire cotton-spinner it is the recollection that a great many people have dropped money over this particular fibre. Nevertheless, it seems probable that the British manufacturer will have to take ramie seriously. It is by no means a new invention; no one can say for how many centuries Orientals have used the fibre, which is found in the bark of a particular kind of nettle, to make themselves rough, strong cloths and nets or lines for their fishing. But as an article of European commerce it is so new as hardly to be counted among our imports; and, though the plants which produce it have for many years been cultivated under European supervision, it has only been for the purposes of speculative experiment. The plants can be seen growing any summer at Kew; one of them, *Rhea nivea*, the Chinese variety, flourishes in the open air. It grows like a Michaelmas daisy in a clump of tall shoots springing from a perennial root, and has big palm-shaped leaves with the under side white, like those of the wild guelder-rose or cherry-apple. If you strip the bark from one of these shoots and fray it with a knife there is disclosed a white, silky fibre, very fine in the strand and extraordinarily strong. What is called China-grass is simply these ribbons of bark carefully decorticated by hand till the fibre is left bare. It is, however, still coarse and hard, and the immensely laborious process of cleaning makes it cost too much to be of any use in general trade. The ramie of commerce, which is to supersede flax, hemp, and all other textile fabrics (according to the true believers), is the same fibre more cheaply and better prepared from a tropical variety of the same species, *Rhea tenacissima*. This differs from *Rhea nivea* only in having a green leaf; but the essential point of the matter is that it is tropical, and will produce at least four crops a year, while the Chinese plant can at most yield two. The intrinsic value of the fibre has for a long time been fully admitted; so much so that the Indian Government twice offered a prize of £5,000 for rhea filasse of high quality produced at a limited cost. The prize was never won. The difficulty lay, as it has lain always, in the production, for which two distinct operations are necessary. First, the stems have to be stripped of their bark, which is done by hand or machinery, though no machine has yet been invented which does the work so well as the cheaply purchased Oriental hand labour. Secondly, in the ribbons so striped off, the fibre, has to be disengaged from the gummy bark, and this is only possible by a chemical process. No mechanical method can thoroughly separate the gum and the fibre, although at least two companies exist which aim at preparing ramie wholly by machinery. Various chemical processes were applied, all of which succeeded in turning out a clean "filasse" of fibre; but unfortunately when the filasse was worked up into yarns, threads, or stuffs, it was found to perish after a few months. The strong chemicals employed rotted the fibre. This happened particularly with the products of rhea prepared in France, where about ten years ago great interest was taken in the matter. After the French, the Americans took it up and prophesied great things; but they also dropped money over it. Now it really seems that England is going to step in and solve the problem. Mr. Gomess, a chemist trained in this country but of Indian origin, has patented a method which turns upon the employment of zincate of soda. A company has been formed, patents taken out all over the world, and a sort of experimental factory is actually at work in London which turns out about two tons a week of ramie ready for spinning.

The process is simple to the last degree. Two things have to be guarded against. First, fermentation of gum in the ramie-ribbons before they come to be manufactured; this is avoided by steeping them in a solution of soda. At present, of course, the preparation of these ribbons is by no means perfect, since no regular market has existed for them. Now, however, in many tropical countries plantations of ramie are being set, and in time planters will learn to send their ribbons carefully packed and cut, with proper precautions against the fermentation which rots them. Secondly, the chief trouble has been to find chemicals which would convert the ribbons into filasse with a sufficiently weak solution. This is what Mr. Gomess has done. The ribbons are first steeped in tanks with a little infusion of nitric acid to soften the gum; after twelve hours of this they go into a bath of alkaline solution. Then they are boiled in a tank of water impregnated with the zincate of soda, and what comes out is pure fibre; the gum and epidermis of the bark is completely dissolved. At no stage is anything used stronger than a 1 per cent solution. The filasse when washed and bleached, may be mixed with inferior silk, or worked up by itself; and it can be sold at a profit for 3d a pound. Flax in the same stage of preparation costs from 8d to 1s. Thus the ramie-fibre can be sold almost as cheaply as the cheapest cotton; it has strength sufficient for any use, and it will neither shrink nor stretch It is very light, and as much sail-cloth can be made from six pounds of ramie as from ten pounds of flax; indeed its advantage in this respect has been already recognised. The 'Defender's' canvas was made of rhea-fibres, which had to be bought up piecemeal in England and were woven in America. It will take dyes of all shades, and from it are made fabrics resembling damask linen, silk, plush, and tapestry. These were good enough to look at, but all somewhat harsh to handle. It is fair, however, to remember that the manufacture is in its infancy, and that the weavers do not yet know how to use the stuff to the best advantage. But there seems no doubt that in the qualities of cheapness and durability it will be a real addition to the wealth of mankind. The filasse is naturally so glossy that it seems specially fitted to compete with linen, and Belfast merchants would probably be well advised to look into the matter at once. Silk it will probably never rival, but it might very well sweep off the face of the earth all the innumerable cheap combinations of silk and wool, which are used in upholstery and the like; and for towels, dish-cloths, and the whole paraphernalia of washing up it ought to be unsurpassable. These, however, are high matters, too hard for anything but the far-reaching experience of woman. The most interesting point about ramie is that the new industry, when created, may not improbably solve a very awkward problem in the management of Great Britain's enormous tropical estate.

The West Indies are in a bad way, as every one knows, because there is no price for sugar, and because the sugar-growing colonies have imported coolie labour to an immense extent. Demerara, for instance, has half a million of them. These coolies must, by the contract made with the Indian Government, receive constantly their shilling a day, or else Demerara must pay their passage and expenses back to India. Say that costs £10 a head. Demerara cannot get rid of her coolies without paying a fine of five millions; she must therefore go on sugar-growing whether she likes it or no. But wherever sugar can be grown rhea can be grown also; and coolie labour is quite sufficiently skilled not only for cutting the crop and stripping the bark by hand or machine, but also for preparing the fillasse. There is everything to be said in favour of employing the Gomess process at the place where the crop is grown. First, a plant which yields four or five crops a year exhausts the soil with great rapidity. The fibrine is only 5 per cent. of the whole, and the other 95 per cent. should go back into the ground,—the leaves as leaf-mould; the sticks, after they have served for fuel, in the form of ashes. Secondly, the less chemicals used the better: and if the process is applied when the bark is soft and freshly peeled, a weaker solution will suffice to dissolve the gum. Also, out of a ton of rhea-ribbons only sixty

per cent of filasse is produced, so that to import filasse instead of ribbons would save forty per cent of frieghtage. It is not to be supposed, of course, that any casual person can go and make his fortune by starting a ramie-farm. But it does seem probable that much of the tropical soil and cheap labour which cannot be productively employed in growing sugar will be turned to this account. Practically, the question resolves itself into this,—Can rhea-fibre be produced cheaply? And does any existing process produce it cheaply without impairng its qualities? It is too early for a final answer. But cloth made from fibre prepared by the Gomess process is two years old by now, and shows no sign of any defect; nor is there reason to apprehend any, since no chemical of any injurious power is used in the preparation. And as to the cheapuess, rhea-ribbons can be brought here 'for about £12 a ton, leaving a good profit to the grower; from these filasse can be produced, which will fetch about £50 a ton, having cost in all perhaps £30 to turn out. These are facts which every one would do well to consider who has an interest in the matter. To put the case concisely, ramie is a fibre which can supplant flax and compete with silk, and it can now be produced almost as cheaply as cotton. If that is true, as a careful inquiry leads us to believe it is, can the tropical colonies do better than cultivate ramie?—*Spectator*, Jan. 2. [See correction on page 603.—ED. *T.A.*]

PLANTING IN BRITISH NORTH BORNEO.

The average crop of the Lahat Datu Estate is, we learn, 8 piculs per field. In some cases 9½ have been gathered but 8 is the average of the whole—and a very good average too. The Kinabatangan Estates also are not, in the main, dissatisfied.

REPORT TO 2ND NOVEMBER.

SAPONG.—Tobacco into shed 30,533 trees and amount stripped, weighed and stapled 17.21 pikuls. I am still cutting and hope to finish some time next month, weather allowing. Am getting a good crop of second growth. Directly Mr. Wheatley comes up I shall begin to cut rentises and give out jungle cutting for next year's crop, which will be at the back of Amboi Hills. Good soil and free from floods.

Ramie looking healthy and strong, also coffee. Ground is being prepared for the transplanting of the Ramie. The last lot sent up by Mr. Wheatley are looking in good condition; the climate suits the plants up here exceedingly well.

Coffee seedlings sent down by Mr. Barraut are looking healthy. I shall plant out the pods sent down from the North, also poppy seeds. I have ordered Orang Kaya Si Bandar to procure 2 pikuls of "Tingang" Fibre from the Pelauns:—1 pikul of the raw stuff and one pikul of the prepared. Orang Kaya reports that it grows abundantly at the Padas where the Pelauns manufacture it into coats which they use when they go on head-hunting, as they say that it resists the poisonous darts.—*British North Borneo Herald*, Jan. 1.

COFFEE IN THE STRAITS:

Mr. Donald Mackay, well-known in Ceylon, first in connection with the construction of certain sections of the Ceylon Government Railways and later as a proprietary planter, arrived at Colombo last month from the Straits and transhipped to the "Masillia" sailing on that vessel in the afternoon to Australia. Mr. Mackay has been to the Straits inspecting his property in Perak. Mr. Mackay has 600 acres in that State planted in coffee, cocoa, and pepper. He informs us that coffee in Perak is looking up wonderfully, indeed, there has been quite a boom in it lately and not only are Europeans taking it up, but wealthy Chinamen have also begun to compete with them as planters.

CEYLON TEA IN RUSSIA.

The following is the letter from Mr. M. Rogivue to the Ceylon Planters' Association:—

Moscow, 10/22 Dec. 1896.
Maroseika, House Lebedieff.

A. Philip, Esq., Secretary to the Ceylon "Thirty Committee," Kandy, Ceylon.

Dear Sir,—My last report was on the 18/30 July. The Ceylon *Tea Pavilion* erected in Nijni Novgorod, on the ground of Hotel "Franzia" except the entrance gate of the Exhibition, was opened on the 1st of July, and closed on the 17th October 1896.

It was built at relatively very high cost on account of enormous rates of materials of all kinds, labour and workmanship, which were ruling there during the whole time the Exhibition was in preparation, in some instances more than three fold the ordinary rates to be paid.

During these three months of its operation the Pavilion was visited by the regretably small number of only between 13,000 and 14,000 persons, but they came from all parts of Russia and very few were foreigners. Among this number and the visitors to the Fair were distributed *gratis* 12,000 1/32 lb. packets of pure Ceylon tea of a good middling quality representing 375 lb. and over 10,000 persons were given tea *in cup* representing 55 lb. or over 21,000 cups. Besides sales made in the Pavilion were as follows:—

896	of	1 lb.	Packets
1,303	,,	½	,, ,,
2,035	,,	¼	,, ,,
2,670	,,	⅛	,, ,,
340	,,	1-16	,, ,,
465	,,	1-32	,, ,,

7,709 packets or 2,335 25-32 lb. which together with the above 12,000 packets went into consumption all over Russia.

Ceylon tea was also used in many of the hotels, tea houses and restaurants inside the Exhibition and its surroundings, in the Fair and in the town.

The *special* advertising through the press, placards, pamphlets and otherwise, done in connection with the Pavilion is specified in my *Exhibition account* which I herewith enclose, under a special heading and was the best that could be done for the money spent, viz. R2,204·20.

Now as to whether *all* this advertising done at Nijni at such a considerable cost of R9,908·57 has been successful and effective and will bring in good results is rather difficult to say at present, the future only will prove it. The Exhibition itself has been a *fiasco* as regards the number of visitors which has not been even one-tenth of the number expected, but I had many inquiries and orders from persons who have visited the Pavilion and I am told that numbers of wholesale merchants dealing in Ceylon tea had also numerous enquiries. Unfortunately for me by far the greatest number of my intending purchasers asked credits for three to six months which I am not in position to give as being too risky a business in Russia.

In order to still continue the advertising which I considered had to be kept constantly before the public and ought not to be allowed to drop, I have since the above, in the months of October and November, inserted several further advertisement in newspapers of many Governments or provinces of Russia, as per enclosed cuttings and have now given out a large advertisement samples inclosed in a Christmas Supplement issued by an important Firm of Publishers 500,000 copies to be distributed with the Christmas newspapers in almost every town and village of Russia.

As already mentioned in my last letter to the Christian of the "Thirty Committee," I have ordered, at the cost of R1,000—from the well-known Potteries of M. S. Ruzuitgow & Co., Limited, the leading manufacture of China, etc., in Russia—5,000 pretty little Tea-pots with the words, *Ceylon Tea* (large) and *M. Rogivue, Moscow*, printed in red and blue colours on the sides, and *two spoonfull of Ceylon Tea being equal to three spoonful of*

China Tea you make a saving of thirty per cent in the drinking the former on the lids (small) those to be distributed as X'mas presents, through my own magazines and by my agents throughout the Provinces, followed by an advertisement as per enclosed lithographed print of a Tea-pot with the words

Translation { Fine flavour

30 %
Economy
Ceylon Tea
M. Rogivue, Moscow
Maroseika, House Lebedief.

The best Tea in the world

Representative of the Ceylon Planters' Association to appear during December and January 3 times in 54 of the best newspapers, magazines and illustrated papers of Moscow, St. Petersburg and the Province, and of which the "*Neva*," an illustrated family Journal has alone a circulation of 175,000 weekly.

I had news from Mr. Stramberg who has, as mentioned in my last letter to the Chairman of the "Thirty Committee" since th 29th October visited many places, he is now in Riga and will return here by the end of the year. So far as I can judge by his letters he has been pretty well successful in assembling people together in order to listen to his lectures and taste Ceylon Tea and a proof that this first tour has had a good effect is that I have received from some places he visited, where Ceylon Tea was not or little known, orders for over 5,000 lb. of my tea in packets. *But*, here again I am placed in a difficult position for, nearly all of these orders being on the *credit* principle for 3 to 6 months and my business being established and based on the *Cash* system—I am not in position to execute them and have had therefore to refuse the greater number. It is certain that if I had been willing to adopt the former. (Credit) system and to give my tea, on the terms generally asked to every recommendable merchant who sent me orders, I would have disposed during the past six years on account much larger quantity of Ceylon Tea and increased also the General Import in Russia to a considerable extent. This makes me think that a good method of increasing the distribution of pure Ceylon Tea through Russia would be,—in order, to enable myself or any other Ceylon or London merchant selling *pure* Ceylon Tea *in packets, and credit* without too great a risk,—to establish a fund or guaranteed sum of say R25,000—£2,000 or about to stand as *Delcredere* for sales at 3, 4, or 6 months term *recommendable* merchants wishing to buy pure Ceylon Tea, to sell and push it in their shops, this same to cover any eventual losses accruing from the kind of business. The actual losses should not be very great after all if the scheme were judiciously managed because:—

1.—By only allowing credit on Promissory Notes and to merchants of good standing (as far as their solvency can be ascertained) the bulk of invoices would be paid and the losses a very small percentage.

2.—Merchants thus ordering Tea at first never give larger orders than for 50 on 100 lb. at a time and each invoice seldom amounts higher than 80 to 100 Rubles so that the risk is pretty well divided amongst many.

This I feel certain, would still more spread the knowledge of Ceylon Tea in Russia, and allow it to be sold to the public in many thousand shops all over the country in places hitherto unreached; I felt very often annoyed when I was compelled to refuse this chance to Ceylon tea in declining the sale, on credit, to many merchants, perhaps very good and solvent, who were willing to buy it and push it I wish the "Thirty Committee" would give this suggestion its earnest consideration for, I think, it is worth it, and I will here mention *confidentially* the reason why I do not adopt *myself* the credit system. They are as follows:—

1 2·3. * * *

I notice from the last "Times of Ceylon" that the *direct* export of Ceylon Tea from Colombo to Russia shows a diminution in 1896 of 45,500 lb for the corresponding period from 1st January to 17th November —in 1895, which is however largely counter-balanced by the increase of export from United Kingdom to countries in Europe, (Russia receiving the bulk) as shown by the figures given in Messrs. Gow, Wilson and Stanton's, London Tea Report of the 11th December, 1896 being very nearly half a million more in this year for the five months of June to November than in 1895. But it may perhaps interest Ceylon to hear that, although the general increase is quite noticeable, it would have been still larger had the Russian Government (Custom's Department) not issued lately a circular from the Finance Minister for a project to come in force on the 1st January, 1897, in order to reduce the cost of control necessitated in every tea packing-room that no merchant not being able to pack with the obligatory Banderoll at least 200,000 lb of tea in a year should be allowed to pack at all but should get his tea already packed and banderolled from bigger merchants.

This has greatly slackened the wholesale tea trade in general for the small merchants, grocers and retailers who are now packing themselves, fearing the new law may come in force at once, have for the last three months reduced their purchases and in many instances, stopped them altogether and will not hold any stock at all, the wholesale tea trade suffering thus immensely until something definite has been settled by the Ministry of Finance.

I was the other day very much interested by an article reproduced in a Russian paper published in German in St. Petersburg (*The Herald*) headed "Russian Trade with China" emanating from the Russian Consul in Fukshow and pointing out the fact that the tea trade from Fukshow has considerably decreased during the past years on account of the strong competition of Indian (Ceylon) teas which in consequence of the energetic efforts of English Tea Planters and Merchants, fined every year an increased sale on all the European markets. The article, which I herewith enclose, says that Ceylon tea is very much liked by the Russian Tea Merchants on account of its strength and fine taste which, without altering their qualities, blends very advantageously with the lower sorts of China tea and consequently the China tea—from year to year produced in decreasing quantity,—is condemned to lose its most important markets.

Therefore the Russian Consul in Fukshow is of opinion that it would be wise, in order to keep up the Russian trade in China to protect the Chinese tea cultivation, thus preventing the English merchants from monopolising the tea trade of the world. "Unfortunately" continues the Russian Consul, "we must place against it the want of enterprising spirit prevailing in Russia where our tea merchants do not possess the necessary energy. As a very characteristic example of this, we may mention the unfortunate experience of a Russian firm in China who tried to inroduce on Russian markets some of "*chops*" Fukshow tea particularly known for their fine aroma. The tea bought by this firm was sent to Moscow and was condemned by the firm for whom is was bought as being *unsuitable*, whilst the next season the very same quality of tea of same "Chops" was bought by a London firm and sent with a good profit to a Russian tea merchant though no Moscow tea merchant was willing to buy it *direct* from Russian firm.

I hear that the Russian Government experiments of tea planting in Caucasus (Batum) under the direction of Mr. Klingen who visited Ceylon two years ago, have not yet given results worthy of mention; seven China men have been engage and a 10 years contract and seedling have already been planted."

I now have the pleasure to enclose my accounts of expenditure made up to 30th November, 1896 and beg to advise the despatch by this same post of a small *registered* parcel to your address containing one of my new placards and two photos of the Nijni Pavilions and electric train advertisements,

Speaking of photos, I think that some more of the last and newly taken in Ceylon (typos, estate views, scenerics, &c.), like the ones you gave me when in 1890 I left Ceylon for Russia, could be of great use and attractive for our lecturing tours.

With the compliments of the season.—I am, &c.,

(Signed) M. ROGIVUE.

NEW TEA COMPANY.

The New Sylhet Tea Estates, Limited, has been registered with a capital of £100,000, divided into 5,000 £10 and 50.000 £1 shares. Object, to adopt and carry into effect an agreement, expressed to be made between C. A. Goodricke and C. Porter of the one part and this Company of the other part, for the acquisition of certain tea estates; to purchase and obtain grants or leases from Government. and to purchase, take on lease or in exchange, hire, or otherwise acquire from any other company or companies, person or persons, any tea or other estates or lands or property of any description situate in British India or elsewhere, or any right or interest therein, or any rights or privileges, including any copyrights or trade marks; to cultivate tea and other produce; and as cultivators, winners, and merchants of and in every kind of vegetable, mineral, or other produce of the soil; to construct, purchase, lease, maintain, and alter any buildings, sawmills, railways, warehouses, and other erections, roads, tramways, and other works, and any steamers, locomotives, or machinery which may be necessary or convenient for the purposes of the company, or to acquire and hold shares in any company formed for the above purposes or any of them. The signatories who take one share each are:—C. A. Reiss, 51, Lime Street, E.C.; C. A. Goodricke, 96, Leadenhall Street, E.C.; E. H. Hancock, 28, Mincing Lane, E.C.; C. Porter, 96, Leadenhall Street, E.C.; H. A. Hancock, 28, Mincing Laue, E.C.; J. C. Ridge, 28, Mincing Lane, E.C.; D. B. Crane, 28, Mincing Lane, E.C. The number of directors is to be not more than eight nor less than four. The first are C. A. Reiss, W. Johnson, H. A. Hancock, W. H. Iugram, and C. A. Goodricke. Qualification, £250. Remuneration, 10 per cent of the net profits after the payment of the dividend on the preference shares, Registered office: 51, Lime Street, E C.—*H. and C. Mail*, Jan. 15.

THE DUNKELD ESTATE CO., LD.

The annual ordinary general meeting of shareholders of the above Company was held at the Company's offices, No. 7, Queen Street, Fort, Colombo, at 11-30 a.m. on the 6th Feb.

Present:—Mr. A. Thomson in the chair, Mr. C. A. Leechman, Directors; Messrs. E S. Anderson and C. J. Donald. Mr. W. H. G. Duncan was represented by his Attorney.

The report and accounts of the Company as published were adopted, and a final dividend of 9 per cent (making 17 per cent for the year) was declared and made payable forthwith.

Mr. Alexander Thomson was re-elected a Director, and Mr. T. J. Stephen was appointed Auditor for this year.

The report was as follows:—

ACREAGE.

Tea in full bearing ..	383 acres
Jungle, &c.	53 ,,
Total Estate ..	436 acres

The Directors have pleasure in submitting to the shareholders the accounts of the Company for the past year.

The quantity of tea secured amounted to 166,262 lb., being an increase of 8,525 lb. on the crop of 1895. The net average sale price was about 45 cents per lb., and the cost laid down in Colombo was about 26½ cents per lb., as compared with about 51 cents and about 29 cents in 1895 respectively.

After making the usual ample allowance for depreciation of buildings and machinery, and including a small balance brought forward from 1895, the amount at credit of profit and loss account is R26,578·12, equal to about 17¾ per cent on the capital of the Company.

An interim divideud of 8 per cent was declared on 8th August last, absorbing R12,000, thus leaving a balance of R14,578·12 now to be dealt with.

The Directors recommend the payment of a final dividend of 9 per cent, making 17 per cent for the year, and that, after payment of R200 additional fees to the Directors in terms of the resolution passed on 18th February 1893, the balance of R878·12 be carried forward to the new year.

The crop estimated for 1897 is 170,000 lb. tea, against an estimated expenditure of R45,580. This is exclusive of outlay to a moderate exteut which will be necessary for an extension to the factory, but for which no estimate has yet been framed.

On the 23rd December last the Directors intimated by circular letter to each shareholder on the register particulars of a proposal received by them for the inclusion of the Dunkeld property in the Alliance Tea Company of Ceylon, Limited. As this proposal appears to be acceptable to the general body of shareholders, the Directors have arrauged to submit the matter to an extraordinary general meeting of the Company to be held after the closing of the annual ordinary general meeting to which this report will be presented.

In terms of the Articles of Association Mr. Alex. Thomson retires by rotation from the office of Director, but is eligible for re-election. Mr. Charles Young has resigned his seat on the Board and does not seek re-election.

Mr. R. L. M. Brown having resigned the post of Auditor to the Company, the Directors, under the Company's Article No. 92, appointed Mr. T. J. Stephen to fill the vacancy thus occasioned.

The appointment of an Auditor for the current year will rest with the meeting.—By order of the Directors,

WHITTALL & Co, Agents and Secretaries.

Colombo, 21st January 1897.

At the extraordinary general meeting of shareholders of the above Company held the same day there were present:—Mr. A. Thomson in the chair, Mr. C. A. Leechman, Directors; Messrs. E S. Anderson and C. J. Donald. The following shareholders were represented by the holders of their powers of Attorney.—Messrs. W. H. G. Duncan and John MacLiesh. The following shareholders were represented by proxy:—Messrs. T. J. de Havilland, R. Wade Jenkins, W. S. R. Cox, H. S. Rix, Harcourt Skrine, Charles Campion, W. H. Walker, Robert Webster, J. B. Spence, W. H. Crowe, W. P. Metcalfe, W. F. Keith, Charles Young, C. Ruinat, Mrs. A. S. Donald, Hon. T. N. Christie and Mrs. M. E. Bois.

Mr. Thomson having taken the chair, the notice convening the meeting was read.

The CHAIRMAN read letter of this date from the Agents of the Alliance Tea Company of Ceylon, Ld., regarding their offer for Dunkeld estate, when it was proposed by the CHAIRMAN, seconded by Mr. ERIC S. ANDERSON, "That the Dunkeld Estate Company, Ld., be wound up voluntarily," which resolution was carried unanimously.

A vote of thanks to the chair closed the proceedings.

CHINA GRASS.

During the past twelve months several factories have been established in this country for utilising the remarkable fibre of the well-known "China grass"—by the way it is not a grass, but a nettle—which has been more or less under the attention of manufacturers for fifty years past. The fibre yielded by the plant is exceedingly strong, and so light that it has been employed as the material for sails of first-rate yachts. The "Valkyrie," for instance had her sails made of this material. When manufactured it has much the appearance of silk, and is used for a very superior kind of lace, damask, and even velvet. The spinners of Lancashire and Yorkshire are using it for these purposes, and there is a factory near Westbourne-park that is turning out a ton or so of bleached fibre for the silk weavers every week. The very valuable character of the fibre has long been recognised, but it has not hitherto been much utilised for manufacturing purposes owing to the great difficulty that has been experienced in extracting the fibre from the stems The plant is of a gummy character, and it has been found very difficult to get at a satisfactory method of "degumming." Decided advances have however been made of late, and the prospects of complete success appears to be good. It seems likely that the West Indies may be able to take up the cultivation of this China grass or ramie. —*Home Paper*.

A NEW FIBRE.—A CORRECTION.

[TO THE EDITOR OF THE "SPECTATOR."]

SIR,—In the very interesting article on "A New Fibre" in the *Spectator* of January 2nd there is a statement which needs correction,—"Demerara alone has half a million of them,"—coolies. The last census returns of British Guiana—which includes Berbice and Essequibo as well as Demerara—give the population of the entire Colony as 278,382, and the number of coolies as 105,463.—I am, Sir, &c.,

Leeds, January 4th. JOHN GRIMSHAW.

[The word "alone" was *not* in our article, but, of course even as it was, the coolie numbers were overstated.—Ed. *Spectator*.]

KANAPEDIWATTIE TEA CO., LD.

This Company has just been incorporated. The capital is R340,000, (with power to increase) in 3,400 shares of R100 each, of which only 3,340 will at present be issued. The directors are Hon. T. N. Christie, Mr. George Christie and Mr. W. Kingsbury, and the Bankers, the National Bank of India, Ld.

Proctors :—Messrs. Fisher & Borrett (Kandy.) Agents and Secretaries. Messrs. Lee Hedges & Company.

This Company is formed for the purpose of purchasing Kanapediwattie, Blackford and St. Cuthbert Estates situated in the Pussellawa and Ulapane Districts. The approximate acreage of the properties is as follows :—Tea 345, Cocoa 6, Cardamoms 6, Timber, Patna, &c. 61. Total 418.

The properties have been valued by Mr. W. P. Metcalfe at R321,845, being on a basis of 8½ years' purchase on the profits of the past three seasons. No agreements for the purchase of the Estates have been made, but negociations have been opened with the Shareholders of the Ceylon Cinchona Association, Limited, (the owner of Kanapediwattie Estate), and the proprietors of Blackford and St. Cuthbert Estates to sell their properties to the Company as from the 1st of January, 1897, for the sum of R322,200 payable in fully paid up shares,

TEA GROWING IN THE CAUCASUS.

Some time ago attention was prominently drawn in home papers to the possibilities of the Caucasus as a tea producing region. Not only was the opinion expressed that Russia, herself a great tea drinking country, would be able to supply her own wants independent of the East, but in course of time she would compete with these countries in the markets of Europe. A gentleman who is himself qualified to speak on the matter informs us that he recently had a conversation on the subject with a Russian visitor. The Russian who knows the region well and who has had a look round Ceylon assured our informant that tea could only be grown in isolated pockets in the Caucasus. The hillsides, he said, were valueless owing to the intense frosts that were experienced. If this description be accurate so much the better for Ceylon, so much the worse for Russia.

FLOWERING PLANTS AND FERNS: IN 2 VOLS.*

MR. WILLIS'S NEW BOOK.

We are indebted to the Director of the Royal Botanic Gardens for a copy of his excellent contribution to the "Cambridge Natural Science Manuals," edited by Mr. Shipley, the accomplished Fellow and Tutor of Christ's College, Cambridge. The book is evidently very carefully compiled, and must prove an exceedingly useful manual. There are a good many engravings illustrating the text, and the indexes and glossary are particularly full. The contents of the 1st volume are indicated as follows :—

Outlines of the morphology, natural history, classification, geographical distribution and economic uses of the phanerogams and ferns.

The second volume contains :—

The classes, cohorts, orders, and chief genera of phanerogams and ferns, alphabetically arranged under their Latin names.

The following extract from Mr. Willis's preface will show the object held in view by the author :—

The aim with which I commenced, nearly seven years ago, to prepare this book, was to supply within a reasonable compass, a summary of useful and scientific information about the plants met with in a botanical garden or museum, or in the field. The student, when placed before the bewildering variety of forms in such a collection as that at Kew, does not know where to begin or what to do to acquire information about the plants. The available works of general reference are mostly very bulky and often out of date, and as a rule refer only to systematic or economic botany, and say nothing about morphology or natural history. I have endeavoured to bring together in this book as much information as is required by any but specialists upon all plants usually met with, and upon all those points—mor-

* Now ready. Crown 8vo. Cloth. 2 Volumes. Vol. i pp. 1—224. Vol, ii, pp. 1—429. Price 10s 6d. [Cambridge Natural Science Manuals Biological Series. General Editor,—Arthur D. Shipley, M.A. Fellow and Tutor of Christ College, Cambridge.] A Manual and Dictionary of the Flowering Plants and Ferns, by J. C. Willis, M.A., Director of the Royal Botanic Gardens, Ceylon, sometime Frank Smart student, Gonville and Caius College, Cambridge, and Senior Assistant in Botany in the University of Glasgow. Cambridge: at the University Press; London: C. J. Clay & Sons, Cambridge University Press Warehouse, Ave Maria Lane; and H. K. Lewis, 136, Gower Street, W.C., Medical Publisher and Bookseller.

phology, classification, natural history, economic botany, &c.—which do not require the use of a microscope. * * * The principal part of the book consists of a dictionary in which the whole of the families and the important genera of flowering plants and ferns are dealt with. The families are treated very fully, more so than in any ordinary text-book of systematic botany, whereas the genera are treated much more briefly unless they show some feature of special interest that is not common to the family.

We may now give a very few specimens of the information contained in the second volume; selecting two palms and our staples tea and coffee :—

Areca Linn. Palmae (iv. 6). About 15 sp. Malacca to New Guinea. *A. Catechu* L. is largely cultivated in trop. As. for its seeds (Areca or Betel nuts). The infl. is below the oldest living leaves, monœcious, with the ♀ fls. at the bases of the twigs, the ♂ above. The seed is about as big as a damson; it is cut into slices and rolled up in a leaf of Betel pepper (*Piper Betle*) with a little lime. When chewed, it turns the saliva bright red: it acts as a stimulus upon the digestive organs, and is supposed by the natives (who use it habitually) to be a preventive of dysentery. For *A. oleracea* Jacq. see Oreodoxa.

Cocos Linn. Palmae iv. 7). 30 sp. trop. S. Am., W. Ind. *C. nucifera* L. (coconut palm) in all trop. countries, and largely cultivated. It grows especially well close to the sea and its fruit is capable of floating long distances uninjured, hence it forms a characteristic feature in the islands of the Pacific (p. 199). It is a tall palm with pinnate leaves and dense monœcious infl. The fruit is one-seeded. The outer layer of the pericarp is fibrous, the inner extremely hard (the shell of the coconut as sold in shops). At the base are three marks corresponding to the three loculi of the ovary, two of which have become obliterated. Under one of these marks is the embryo. The testa is thin and is lined with white endosperm, enclosing a large cavity, partly filled with a milky fluid which serves as a water-supply in germination. The uses of this palm are many; it furnishes many of the necessaries of existence to the natives of tropical regions—edible fruit, palm wine (cf. Borassus), sugar (cf. Arenga), leaves for thatching, palm-cabbages (the young bud cut out of the top of the tree), &c. The fibre (coir) of the pericarp is used in many ways—in making coconut matting, cables, brushes, &c. Coconut oil is obtained from the endosperm; by pressure it is separated into a solid part (stearine, used for candles) and a liquid (oleine); the remains of the endosperm (coconut cake) are used in cattle-feeding. The outer wood of the tree is hard (porcupine wood) and is used in making ornaments, &c.

Coffea Linn. Rubiaceae (ii. 14). 25 sp. trop. Old World. *C. arabica* L. is the coffee plant, largely cultivated in the tropics. It is a shade-loving plant, and is cultivated in the shade of larger trees. The fruit resembles a cherry in appearance; it is a 2-seeded drupe. The pulp and the endocarp are mechanically removed. The seed ("coffee-bean") has a deep groove on the ventral side. By soaking it in water the endosperm may be softened and the embryo dissected out. The plant is subject to the attacks of many insects and fungi; one of the latter (*Hemileia vastatrix*) was the cause of the ruin of the coffee industry of Ceylon. [See Haberlandt's *Tropenreise*, p. 241.]

Thea Linn. (excl. *Camellia* Linn). Theaceae. 8 sp. India to Japan. Often united to Camellia; T. has stalked nodding flrs., C. sessile upright ones. The chief sp. is *T. sinensis* L., the tea plant, largely cultivated in China, India, Ceylon, &c. When growing wild it forms a tree, but in cultivation it is kept pruned into a small bush. The young shoots are nipped off at certain stages (according to the kind of tea desired) and undergo various subsequent treatments (see Tschirch, *Indische Heil and Nutzpflanzen*). [*Synomymy: T. Bohea* L. and *T. viridis* L.=*T. sinensis; T. Camellia* Hoffmgg.=*Camellia aponica*.]

Theaceae. Dicotyledons (Archichl. Parietales). 16 gen. with 175 sp. trop. and subtrop. Treet or shrubs with alt. leathery leaves. Flrs. usually solitary, ♀, often partly spiral. K 5, 6 or 7, imbricate, persistent; C 5, rarely 4, 9 or ∞, imbricate; A ∞, rarely 5, 10 or 15, free or in bundles or united into a tube; ovary superior, 2- 3- 5- 10-loc.f with 2, 4 or ∞ annatropous ovules in each loc. Capsule or drupe. Embryo usually curved; endosperm little or none. The only important economic plant is Tea; Camellia is a favourite in green-houses. *Chief genera:* Thea, Camellia, Gordonia, Ternstroemia, Eurya. Benth-Hooker unite to T. several other genera to form the order Ternstroemiaceae (q.v.). Warming places T. Cistiflorae.

The preface is dated from Glasgow, August 10, 1896.—In respect of tea, Mr. Willis knows by this time doubtless, that the plant chiefly cultivated in Ceylon, as in India, is not the China species, but the Assam hybrid and indigenous kinds. In making the above extracts we feel injustice is done to Mr. Willis, in not giving the explanation of the abbreviations used, such abbreviations as well as other explanations being prominently shown in the pages before us. Altogether, however, we feel sure these two handy manual volumes will be much appreciated in Colleges and Schools, as well as by botanical students everywhere, making the name of our new Director and his good work, familiar, not only in the mother country, but throughout all British Dependencies.

KANDAPOLA TEA COMPANY, LIMITED.

Registered January 14, by Mullens and Bosanquet, 11, Queen Victoria-street, E.C., with a capital of £200,000 in £10 shares, 10,000 of which are six per cent cumulative preferences shares and 10 000 ordinary shares. Object, primarily, to acquire the following estates or plantations—viz, the Kandapola estate, and the Monkswood estate, adjoining thereto, both situate in the district of Kandapola, in Ceylon; the Frotoft estate, and the Rushbrook estate adjoining thereto, both situate, in the district of Ramboda, in Ceylon; and the Erroll estate, situate in the district of Dikoya, in Ceylon; to develop, deal with, and generally turn to account the same in such manner as the company shall see fit, and, generally to carry on in all or any of their respective branches the businesses of tea planters, tea merchants, tea exporters, general planters and growers, fruit and vegetable producers and preservers, coffee, cocoo, sugar and cinchona merchants, wine and brandy makers, brewers, manufacturers of all kinds of vegetable products, farmers, pasturers, cattle and horse breeders, graziers and agriculturists, mine owners, colliery and quarry owners, shipowners, charterers of vessels, shipbuilders, metallurgists, dealers in gold, silver, and other precious metals, pearls and other precious stones, and as carriers by sea and land; to lay out towns and villages, and to promote immigration thereto. The signatories are:—

	Shares.
R. A. Bosanquet, 38, Mincing-lane, E.C. ..	1
G. F. Traill, Colombo, Ceylon ..	1
J. H. Alexander, 66, Inverness-terrace, W. ..	1
W. R. Alexander, 66, Inverness-terrace, W. ..	1
G. S. Bosanquet, Bitchet Woods, Sevenoaks ..	1
E. T. S. F. Harvey, 35, Lithos-road, South Hampstead ..	1
W. H. Courthope, 20, Birchin-lane, E.C. ..	1

The number of directors is to be not more than seven nor less than three; the first are the first three signatories to the memorandum. Qualification, 50 shares. Remuneration £100 each per annum, and £150 for the chairman. Registered office: 38, Mincing-lane, E.C.—*H. & C. Mail*, Jan. 29.

THE CULTIVATION OF LIBERIAN COFFEE is, a Pamphlet on the Opening up and Management of a Liberian Coffee Estate in the Malay Peninsula, by H. Hüttenbach (reprinted from the *Selangor Journal*,) which has been sent us: it seems very useful.

THE CLUNES ESTATES COMPANY OF CEYLON, LIMITED.

At the extraordinary General Meeting of shareholders of the above Company held on Saturday, February 13th, 1897, at 12-30 p.m. at the Company's Offices No. 7, Queen Street, Fort, Colombo, the following were present:—Mr. W. Forsythe, Chairman, Mr. S. L. Harries, Directors; Messrs A. Thompson, Jas. Forbes, L. E. Edwards, E. H. A Vanderspar, George Vanderspar, and W. E. Mitchell. Mr. E. John was represented by his Attorney Mr. R. John.

Mr. Forsythe having taken the Chair the notice convening the meeting was read.

An interim dividend for 1896-1897 of 5 per cent was declared and made payable forthwith.

A vote of thanks to the Chair closed the proceedings.

PRODUCE AND PLANTING.

RUBBER PLANTATION.—Planters on the look-out for profitable products to cultivate might, where possible, turn their attention to the rubber industry. In the course of a single year the exports of this commodity from Lagos increased from 5,867 lb. to 5,069,576 lb., a growth of trade probably without parallel. But the natives who obtain the rubber in the forests employ such wasteful and destructive methods of "tapping" that the supply is sure to dwindle away, as has happened through the same on the upper waters of the Amazon. If, then, this young and most profitable industry is to become a permanent source of wealth, whether at Lagos or elsewhere, some method of insuring constancy of supply must be adopted. There are two ways by which that might be accomplished. The rubber-producing forests could be leased on such conditions as would give the lessees personal interest in preventing destructive "tapping." Or, better still, as not confiscating native rights of free search, plantations may be established at suitable places. Once the trees reached maturity, they would continue to yield the precious juice for many years if properly treated. Before science turned its attention to the matter the invariable practice was to bleed a tree to death, and it is that barbarous method which still obtains at Lagos. But by a new and improved process sufficient vitality is left in a "tapped" tree for complete recovery and future fruitfulness.—*H. & C. Mail*, Jan. 15.

THE COMING RIVALRY IN TEA MANUFACTURE.—It is of course very gratifying to the feelings of Indian and Ceylon tea planters to learn that their methods of manufacture are worth imitating by the Chinese and Japanese tea growers, and if that were all it would be quite pleasant. The Chinese and Japanese, however, are not proud, and they wish to learn all about everything as soon as possible. We see by the *Ceylon Observer* that an enterprising Chinese "creeper" is in Ceylon yearning for information. It is mentioned, too, in another Ceylon paper that an enquirer of Japanese nationality is also believed to be searching for more light. It is a proud and and happy position for Indian and Ceylon planters to control the tea markets of the world, and they may be lifted up at the idea that their rivals recognise their supremacy, and would adopt that way of doing business. It is not, however, desirable that these competitors should find the path of knowledge readily accessible. Supermacy in the tea market was fought for keenly, and won by pluck and preservance. It must be held tightly, and with as much reserve as is possible in these days of universal knowledge. The game may become a very keenly contested one before long, and no one can afford to give away a point. Of course, if the Chinese and Japanese mean to manufacture tea on the same lines as India and Ceylon they will find out all about it soon enough There is no mystery about the process of manufacture. That the Far East is becoming very much alive to the value of machinery we are ourselves aware, illustrations and descriptions of machinery and newspapers containing them being in demand just now in that quarter. But this is no reason for hurrying up events or assisting competitors in their task of competition.

A CHANGED TEA ROUTE.—Commenting on the tea routes from China and India to Russia, the *Grocer* says:—"The way in which railways and tariffs modify the conditions of trade and effect great changes is illustrated by what has taken place in regard to the tea routes from China and India to Russia. Now that the railway has linked Merv, Bokhara, and Samarkand with Russia proper, the Russian Government has absorbed the Bokhara customs, and since the beginning of 1895 has levied equal customs duties along the whole line of the frontier from the the Caspian to the Pamirs. Consul-General Elias' reporting on Persian trade, states that the altered conditions have led to a deflection of the tea route of the greatest importance to Persia and India —teas formerly sent to Russia *via* Meshed being sent now *via* Batoum, and Persia thus losing £8,000 a year in customs alone. The Collector of Customs at Bombay, reporting on the matter, states that the green tea trade is by far the most important branch of the trade between Bombay and the Russian possessions in Central Asia. The tea is imported from China into Bombay, and re-exported from there to Bandar Abbas, chiefly by Mogul merchants. A considerable quantity of Indian tea is also shipped to Bandar Abbas from Bombay. The figures of China tea to Persia show, however, a serious falling off in the first nine months of 1895-96. The Bombay Collector remarks that 'Indian tea has benefitted by the new customs regulations, while the trade in China tea has suffered, though not as yet very severely. There is, however, some risk of Bombay losing its position as the centre of the trade in China tea, in consequence of the opening of the Batoum route.' In the opinion of the Persian Consul, it is wrong to surmise that Indian tea has benefitted by the changes—in fact, he thinks China is now sending a good deal of tea to Russia via Batoum, and that 'India will probably lose the handling of the tea by which she has, up till now, profited.' The whole of the tea trade for Central Asia twenty years ago was in the hands of British Indian tea planters. Today they do not supply a leaf. It seems strange that it should have come to pass that while Indian black tea has been steadily driving the Chinese article out of most of the far-distant markets of the world, Chinese green tea in a short space of time, and apparently without an effort, drove the Indian article clean out of its own market. Apparently the duty on Chinese tea at Bombay, though only 5 per cent., together with the saving in freight direct from China to Batoum, are the causes which have thus dislocated a branch of trade in which are concerned the interests of Indian Indian tea growers, Afghan and Persian carriers, and merchants, the Persian Government revenue."

THE TEA INDUSTRY AND THE FAMINE.—The community in London interested in tea are, as will be seen from the report of a meeting in another column, well to the fore as regards the Famine Fund. The sums contributed by members of all branches of the tea industry are notable evidence alike of the promise of tea enterprise in connection with India and of the desire on the part of those who constitute it to join with alacrity in the movement for for alleviating the distress of the native population in the famine-stricken districts. The same feeling, we are sure, exists throughout the financial world of commerce here. The movement in the large towns for gathering contributions towards the Famine Fund is proof that the appeal to private charity, tardy though it was, will not be made in vain.

THE FAMINE AND THE LABOUR QUESTION.—The following letter signed "Tea Planter" appears in today's *Standard*; "In view of the terrible sufferings of our

fellow-subjects in the North-West and Central Provinces of India, may I suggest a measure which would tend to relieve, even in a slight degree, some of the existing pressure? At this season of the year it is usual for the tea gardens in Assam, Cachar, Sylhet, and other places, to recruit labourers from the famine districts by head men sent from the different gardens. It is a very unsatisfactory and expensive methods, as these men frequently return without a single recruit, after having received advances of hundreds of rupees from their garden managers, on the faith of glowing reports as to the number of labourers collected. What I would suggest is that the Indian Government should appoint immigration agents in each of the affected districts, to whom the managers of gardens could apply direct for the number of labourers required, and who would send them up under proper supervision. Many gardens are short of labour, on account of the difficulty and expense of getting it; but if each garden manager could notify his wants direct to the Government, and could be supplied with the labour required quickly and cheaply (he, of course, paying all expenses), it would be to the mutual benefit of the Government and planter. From my knowledge of the tea districts work could be found for at least another half million of labourers, who would be rescued from starvation, and would enjoy a degree of happiness and prosperity unknown in their own country."

THE CANE SUGAR QUESTION.—The sugar planters of the Mauritius have followed the example of those in the West Indies, and are asking that their lot may be ameliorated without indicating how it is to be done. On Friday Lord Stanmore and the Mauritius Delegates' Committee attended by appointment at the Colonial Office, and presented to Mr. Chamberlain a petition from Mauritius, signed by over 10,000 persons interested in the sugar industry, praying that measures may immediately be taken by the Government to relieve the critical position of the colony and enable its produce to compete in the markets of Great Britain and her dependencies on equal terms with beetroot sugar from foreign countries. Lord Stanmore, in introducing the deputation, pointed out that the position of Mauritius in the event of the failure of the sugar industry would be worse than that of the West Indies, as the colony had no other industry to fall back on. He claimed the sympathy and assistance of the Government. Mr. Chamberlain, in his reply, assured the deputation that the Government was fully aware of the gravity of the situation, and sympathised with hardships that were not the result of natural causes, but of artificial interference. He could give no indication of the course Her Majesty' Government would think fit to pursue until the Commission lately sent out to the West Indies had reported, which it was expected to do in about three or four months' time.—*H. and C. Mail*, Jan. 22.

CLOSE OF THE INDIAN TEA SEASON FOR 1896.

The following figures and comparisons from the latest circular of Messrs. Watson, Sibthorp & Co. of Calcutta are of special interest:—

Exports, Stocks, &c., of Indian Tea.

	1896.	1895.	1894.
	lb.	lb.	lb.
Experts from Calcutta to Great Britain from 1st Jan. to 31st Dec. ..	128,482,030	121,140,686	116,280,876
Experts from Calcutta to Great Britain in December ..	12,028,512	10,264,420	10,494,415
Stocks in London on 31st December ..	54,100,000	52,638,498	47,930,601
Deliveries in London from 1st Jan. to 31st December ..	124,667 006	115,003,291	117,425,711
Do in Dec. ..	11,600,000	9,938,268	9,320,911
Landings in London from 1st Jan. to 31st December ..	125,385,831	119,806,191	115,323,648
Do in Dec. ..	18,500,000	17,305,803	13,808,490
Exports from Calcutta to Australia & New Zealand from 1st Jan. to 31st Dec. ..	5,482,881	6,172,486	5,489,390
Do in Dec...	589,718	608,795	434,314
Do from Calcutta direct to America from 1st Jan. to 31st Dec...	1,164,279	939,040	505,679
Do in Dec. ..	149,278	66,251	61,215
Exports from Calcutta to all other places from 1st Jan. to 31st Dec...	5,828,365	4,177,528	4,462,270
Do in Dec...	604,604	670,717	359,553

"RESERVE FUNDS OF TEA COMPANIES."

Some days ago a local daily contemporary had a deliverance on the above subject and, quoting from a London Sharebroker, he afforded but a poor picture of the stability of Ceylon Tea Companies so far as "reserves" were concerned. This may be judged by the extract we append:—

"The following table compiled by one of the best-known London sharebrokers doing business in Ceylon stock tabulates the information so that the position of affairs in this respect can be seen at a glance:—

STATEMENT OF THE RESERVE FUND OF SOME ESTATE IN CEYLON.

OF 45 STERLING COMPANIES:—	
Total indebtedness	£5,936,999
Deduct Consolidated Tea and Lands Company	1,800,000
	£4,136,999
Total Reserve £144,482, or 3·49 per cent. Of this total reserve the Ceylon Tea Plantations Co. has £70,000	
The indebtedness of the C. T. P. Co. is	248,460
Leaving for the other 23 Companies	£3,888,539
And the balance of the Reserve Fund, £144,482 less £70,000, allows £74,482, equivalent to a percentage of 1·91	
OF 29 RUPEE COMPANIES:—	
Total indebtedness	R7,141,458
Total Reserve R262,000, or equivalent to a percentage of 3 6	

'But these figures present the case in a much too favourable light, seeing that the R262,000 set down as the reserve of the Rupee Companies are strictly speaking no reserve at all, being chiefly sums passed to "extension fund account," and have all been expended in developing the estates. They are not reserves in the proper sense of the word in such a liquid form as reserves should be."

Now in referring to the above statement, we notice in the first place that the London Sharebroker talks of the "*indebtedness*" of the Companies, under which term he evidently includes the *share capital* which, of course, is *not* indebtedness. Next he proceeds to draw a comparison between the Reserve Fund, and the so-called "*indebtedness*." In the opinion of reliable mercantile authorities, this is not sound—unless it is contended that in the case of Tea Companies a *Cash* Reserve Fund should be built up as against the possibility of a loss of the capital of the Company, or in other words a collapse of the Tea Industry. Such an eventuality we are not going to discuss, at any rate for the present; and we think for our contemporary or his sharebroking friend to suggest such a thing in the way they have done, is far more likely to do harm than to do good. The more general opinion

seems to be that so far as Tea Companies are concerned, there are on y two uses for a *Cash* Reserve Fund :—1st, to provide money to pay off debts, such as Debentures ; and 2nd to equalize dividends in the case of Companies which have a proportion of their capital in Preference Shares.

Where a Company is indebted under a mortgage, or by a Debenture issue, or in any other way, there must, of course, be a date when the principal of such debt falls due, and we quite think that such a Company should, out of its current profits, build up a Cash Reserve Fund to pay off such debt. And again, as regards Companies, the capital of which is divided into Preference and Ordinary shares, although the Preference shares are not "indebtedness" in the ordinary acceptation of the term ; yet they may be said to operate as a mortgage on the future profits of the Company (assuming that they are "Cumulative" Preference shares, as is usually the case) ; and it is in such cases also very advisable to provide ahead—by means of a Cash Reserve Fund—for the payment of interest on such preference shares in view of the possibility of a falling-off in returns, coupled with the necessity of payment of the preferential interest, entrenching in the fair earnings of the ordinary capital. But in the case of Companies which are not indebted in any way, and have their capital only on one class of shares, we cannot really see that there is any special necessity for a *Cash* Reserve Fund.

Again, our contemporary talks of Reserve Funds adding to the "stability" of Tea Companies. If he refers to those with Debenture or Preference share issues we may agree with him; but let us take the case of a Company with only one class of shares : if a "Reserve Fund" is created the value of the shares will of course go up correspondingly, but the value will at the same time fluctuate in accordance with the increase or falling-off of the annual profits of the Company. We must continue to hold, in fact, that the "stability" of our Tea Companies, depends mainly on the stability of the Tea Industry—Reserve Fund or no Reserve Fund.

When, however, we look down the Colombo and London Tea Share lists, we do find one point of general difference of considerable importance, namely that nearly the whole of the London concerns have "Debenture or Preference issues"—or both ; while in Colombo such a thing is a rare exception. In other words—and speaking generally—Colombo Companies are not indebted and their future earnings are not mortgaged. That being so, our prosperous local Companies may be regarded as occupying a first-class position ; for, so long as the Tea industry exists, they can divide their profits among those shareholders. The contention, however, seems to be that in view of the possibility of a time coming when there may be no profits to divide, the Reserve Fund will be there to provide a dividend ; but would that fact really improve matters? Out in Ceylon, every shareholder, or his representative, knows pretty well all about the position of the Tea-planting industry, and we rather think there would be a general outcry if Directors commenced to pay smaller dividends and announced that they intended in future, to combine with Tea-planting a species of Savings Bank business to guard against the shareholders, like small boys, spending their pocket-money injudiciously !

Let it not be forgotten too that there are extremely limited means here for the profitable investment of money of the character of Reserve Funds which practically become Trust Funds. Even with fairly good security, shareholders can themselves do better with their dividends, than Directors would be able to do for them if the money went to a Reserve Fund. On the whole, therefore, so far as local Companies are concerned, we cannot say that a case for "Reserve Funds" has been made out ; while in respect of London Ceylon Companies, considering the keen business criticism to which they must be liable in the "City," we should like to see financial authorities at home, lead the way, before we presumed from this end, to dictate to their Chairmen and Directors what would be the best course for them to pursue.

INSECT PESTS AND THEIR ENEMIES :

AN INTERCHANGE BETWEEN CEYLON AND SOUTHERN INDIA PROPOSED BY MR. E. E. GREEN.

Mr. E. E. Green of Eton, Pundaluoya, writing on the 4th Feb. gives us the following interesting information :—

"I have been interested in the copy of the *Hawaiian Planters' Monthly* with the interesting report on Insect Pests by Mr. Kœbele. There seems to be no doubt that the introduction of the natural enemies of the several insect pests has been most successful in Hawaii—thanks to the personal supervision of such an expert as Mr. Kœbele has proved himself to be.

"I am glad to note by a letter published in your January number of the *T. A.* that the Indian Planters' Associations are taking up the subject of the introduction of Lady Bird Beetles and are anxious to join us in securing the services of Mr. Kœbele. The letter in question—headed Notes on Lady Birds and Coffee Bug on the Lower Pulneys'—gives some interesting particulars of an indigenous species of Lady Bird (*Chilocorus Nigritus*) that appears to prey upon the Green Bug (*Lecanium Viride*) in that country. Mr. Newport, however, reports that though the beetles are doing good work in a small way they are not increasing in numbers as rapidly as could be wished. This is only what might be expected from an indigenous insect which has no doubt its own natural enemies to keep it in check in its native country. But it has struck me that this same Indian beetle, if introduced into Ceylon, might have a freer hand—and might prove a real service on the few coffee plantations remaining in Ceylon. This little experiment would, at any rate, be inexpensive and easily carried out. I should be glad to correspond with Mr. Newport with a view to the interchange of natural enemies of insect pests between India and Ceylon. We, on our side, might be able to supply the Indian planters with a few species which—hampered by their own parasites—are unable to do appreciable service in this country, but which if sent to India—minus their enemies—might increase as the Australian beetles did in Hawaii."

We certainly hope the experiment will be made.

HORREKELLY ESTATE COMPANY LIMITED.

The annual general meeting of shareholders of this Company was held in the Registered office (Messrs. Lewis Brown & Co.'s) on Feb. 6th at noon. Mr. C. E. H. Symons presided and those present or represented, were, Mr. F. W. Bois, Mrs,

Mary Bois, Mr. Percy Bois, Mr. Henry Bois, Mr. A. H. Christian and Mr. W. J. Carver, by their attorney, Mr. F. Bois; Mr. F. Liesching, the Estate of H. Ledward by the Administrator, Mr. F. Liesching, the Estate of Mrs. Ledward by Mr. F. Liesching, hon. C. P. Layard, and Messrs. Julius and Creasy by Mr. F. Liesching; Messrs. S. Green, F. Beven, F. C. Loos, F. J. de Saram, R. W. Nunn, Hon. Sir J. J. Grinlinlinton, by his proxy, Mr. R. L. M. Brown, and Mr. R. L. M. Brown (Secretary.)

Notice calling the meeting were read and minutes confirmed.

THE REPORT AND ACCOUNTS.

The Chairman submitted the report and accounts. The report is in the following terms:—

1. In submitting the accounts for 1896 the Directors have much pleasure in calling attention to the increasingly satisfactory position of the Company, the result for the year showing a sum of R40,518·57 available for distribution, after writing off R7,000 as depreciation of plant and machinery.

2. The Directors recommend that a dividend at the rate of 10 per cent for the year on the capital of the Company be declared. This will absorb R40,000 and leave R518·57 to be carried forward to 1897.

3. During the past year a further sum of R15,000 has been paid in reduction of the mortgage debt, which now stands at only R10,000.

4. The crop of coconuts in 1896 was a large one, and was sold as nuts, and not made into copra as hitherto. It gives ample testimony to the value of manure, which is now being applied systematically and on an increased scale, thus justifying the enhanced expenditure sanctioned under this head by the Directors.

5. The working of the estate for the years 1894, 1895, and 1896 compares as follows (the item of interest being excluded):—

	1894.	1895.	1896
Expenditure on Estate and in Colombo office	R33,243·74	32,747·69	30,463·23
Quantity of Coconuts produced	No. 1,002,237	1,332,965	1,548,081
Do. Coir Fibre made	Ballots 40,245	25,703	23,859

6. The Directors are happy to report that the prospects of crop for 1897 are favourable, and with a normal season the result should be satisfactory.

7. Two Directors—Messrs. Percy Bois and F. J. de Saram—retire by rotation, and are eligible for re-election.

8. The shareholders have to appoint an Auditor for 1897.

The Chairman remarked that the report and accounts had been sent round and as every shareholder had received a copy he moved that they be taken as read. (The meeting having acquiesced) the Chairman went on to say that he thought the report spoke for itself. It showed that they had had a very prosperous year, owing to the climate as well as the systematic manuring they had been carrying out. The result was in the report and a very creditable one he thought it was. Next year promised to be quite as good, but whether the prices they would get for their produce would be as good was another matter. They had sold half the crop of coconuts already on the same terms and conditions as last year but at 50 cents less a thousand, but if exchange fell towards the end of the year the price of coconuts might rise and they would be able to get as good a price as they got last year. The work done by their Superintendent, Mr. Beven had been very satisfactory. There had been a good deal of difficulty with labour but that was not uncommon every where. With these few words he moved the adoption of the report and accounts.

In answer to Mr. Green the Chairman explained that half of the forthcoming year's crop had been sold for R36 50 per 1000 as against R37 per 1000 for the last half year.

The report and accounts were adopted.

THE MORTGAGE ON THE PROPERTY.

The Secretary (Mr. Brown) said it had been brought to his notice by some of the shareholders that the accounts were not particularly clear as regarded the reduction of the mortgage. This item did not appear on the face of the Company's accounts as issued, but of course it appeared in the report of the Directors. What appeared in the accounts was a balance sheet not a working sheet; it showed the balance after all the work had been done. In one of the columns the mortgage stood at R10,000 and in the previous accounts it stood at R25,000 so that was where the R15,000 came in. The amount remaining was R10,000 and it was for the Directors to say, when an opportunity occurred, whether that amount should not be paid off also.

Mr. BEVEN proposed that a dividend of 10 per cent be declared in accordance with the recommendations contained in the Director's report.

The SECRETARY pointed out that as a rule the dividend was paid on 1st April because the crop was allowed to mature for some time on the estate before delivery. The crop plucked in the end of December required time to mature and it was some time before it could be converted into money. They were, however, able to declare a dividend a little earlier this year because the crop was not in coprah, but he hoped that in fixing a date the meeting would not fix it too early a date for the shareholders next year, when the crop might be in copra would be grumbling if the dividend was not paid so early date. He suggested that the dividend be payable on 1st March.

Mr. BEVEN adopted this suggestion and moved accordingly.

Mr. GREEN seconded and the motion was carried unanimously.

ELECTION OF DIRECTORS AND AUDITOR.

On the motion of Mr. GREEN seconded by Mr. NUNN, Messrs. PERCY BOIS, and F. J. DE SARAM were re-elected Directors and on the proposal of Mr. NUNN, seconded by Mr. GREEN Mr. H. J. SCOTT was re-elected Auditor of the Company at a fee of a R100.

A vote of thanks to the Chairman terminated the proceedings.

LONDON REVIEW OF THE TEA MARKET.

INDIAN.

(*From Stenning, Inskipp & Co.'s Indian & Ceylon Tea Market Review for 1896*)

LONDON :—14, Mincing Lane, Jan. 1897.

POSITION AND PROSPECTS.—A reference to the figures given below will show that Imports during the twelve months ending 31st December last, mark an increase of 5,604,000 lb., and the deliveries during the same period an increase of 9,584,000 lb., compared with 1895. The total imports for the season are expected to reach about 127,000,000 lb., against 117,932,000 lb. last season, and this additional quantity should not be difficult to deal with. The quality of the crop generally is good, and as the range of prices is extremely moderate, the consumption, which last month made a great stride, may be expected to proceed at a rate that will absorb the extra supply.

On the whole, the season's results to producer should prove encouraging. Those who have maintained a good standard of quality will have found compensa-

tion in a steady market at satisfactory prices throughout; while others who cannot successfully compete in the production of high-class teas will have been benefited by a more abundant output. The recent rise in Exchange, and the dearness of native food in the districts, caused by the Indian famine, are rather serious drawbacks which will, we fear, have to be contended with for some time. But some offset to these will be found in a more plentiful supply of labour. As regards the future, the demand for teas of sterling character should not be prejudiced by the larger crops of coming seasons from districts which, owing to canditions of climate, soiles, &c., have largely to look to quantity. But for ths common and medium classes the outlook is lesas reassuring, because neither in India or Ceylon has the limit to production been reached, certainly nor in India were large additional areas of cultivation will soon be coming into bearing, and thus, with ever increasing quantities coming on the market, the tendency must be to a further weakening of prices. In these circumstances the grower naturally watches with some concern the progress in the demand for British grown tea in other countries. During 1895 the quantity sent from London to America, the Continent, and other countries amounted to 3,924,551 lb., and it is disappointing to find that the figures for 1896 show an increase of only 381,000 lb., and this, in spite of the preserving efforts being made to extend the business. The shipments direct from Calcutta to countries other than the United Kingdom show a falling off of 658,000 compared with last year. Against this, however, 1,255,000 lb. more of all teas have been sent to United Kingdom for transhipment to other ports, the figures being 6,395,000 lb. during 1896 and 5,140,000 lb. in 1895.

The importation of a consignment of machine-made tea from Foo Chow has excited some interest in the China market, owing to its novel y. This tardy innovation in Chinese methods if it were applied systematically would no doubt lesson the cost of production, but it would not go far towards resuscitating their lost trade. China tea has passed out of favour by reason of its inherently poor character compared with the teas of India and Ceylon, and the use of machinery in its manufacture could not overcome this difficulty.

CEYLON.

THE COURSE OF THE MARKET.—Contrary to 1895 a dull tone with lower prices marked the opening of business due to heavy supplies and less attractive teas. A slow enquiry was experienced in February and although auctions were smaller inactivity continued until the latter part of March, when there was a slight recovery, especially in the lower priced teas, and after the holidays in April a good demand set in at dearer prices which continued throughout May, early in June arrivals were heavy, and prices fell. Better quality and less pressure to realize throughout July and August led to a steadier tone at higher prices. September auctions were rather small, the quality was good and the market hardened throughout. Larger supplies early in October causod quotations to give way slightly but they steadied again as quantities fell off, and with continued good quali y in November the market was strong; less attractive quality in December made lower quotations and the maket coutinued weak until the close business for the year, more particularly for such of the higher grades as lacked quality.

SMALL BREAKS.—Since the 1st October, lots of less than 18 Chests, 24 Half-Chests or 40 Boxes have been reckoned as Small Breaks.

QUALITY.—Fine Invoices were somewhat scarce until April; afterwards the general character became indifferent; but from August to November an improvement was noticeable which was, however, succeeded by some falling off in December. On the whole we consider the year's imports to have been up to the average though a great quantity of very poor tea has been produced which has come here chiefly on Colombo purchase account. The prices now obtainable for tea of this low class can leave but a sl.n ler margin of profit, and, owing to the tendency to lower prices generally, its production may at no distant date become altogether unprofitable, especially since China tea at the same price is better in appearance, if not in liquor also.

OTHER MARKETS.—From Colombo, shipments as follows (to the 22nd December):—

To Australia and New Zealand, 11,746,500 lb., against 9,314,200 lb. in 1895.

From London the Exports are as follows:—

	Continent. lb.	America. lb.	Canada, &c. lb.	Other Countries. lb.	Total, lb.
1896..	4,535,100	1,386,020	1,346,188	975,130	8,242,438
1895..	3,786,178	1,420,262	1,113,165	773,836	7,093,441

In previous years when the destination of Exports was not distinguished the Totals were as follows:—

1894. lb.	1893. lb.	1892. lb.
5,123,862	4,065,709	3,273,955

		Pkgs. Aver.	Per lb.
Average Price ..	1896 ..	1,066,912	8¼d
	1895 ..	965,052	8½d
	1894 ..	889,573	8⅞d
	1893 ..	846,762	9⅛d
	1892 ..	789,231	9½d
	1891 ..	755,552	9⅞d
	1890 ..	535,611	10¾d
	1889 ..	431,043	11d
	1886 ..	303,284	11¼d
	1887 ..	182,955	10¾d

USEFUL HINTS:

LOSS IN WEIGHT.—As this occasionally gives rise to much dissatisfaction we offer the following suggestions: that the gross weight of the package should be a few ounces, say four or five, *above* an even number of pounds, and that the empty package, complete with lead, nails, bands, &c., be to a like extent *below* an even number of pounds. In weighing here the gross weight is *reduced* to the even number of pounds, whilst the tare is *increased* to an even number of pounds.

With regard to Garden Bulked Teas, it is imperatively necessary to put an equal quantity into each package of the break, and this quantity should be four or five ounces over the desired weight of contents, viz., if the packages are invoiced to contain 100 lb. Tea each, not less than 100 lb. 4 ozs. should be weighed in; test packages, weighing here a fraction under 100 lb. are reckoned as 99 lb. only, or a loss of 1 lb. on each chest of the break.

Careful observauce of the foregoing precautions would no doubt prevent much loss and disappointment.

DRAFT of 1 lb. per package on all packages grossing 29 lb. and upwards is allowed to the buyer.

WEIGHT OF PACKAGES.—When a gross weight of 129 lb. is exceeded, there is an additional charge of 5d. per chest up to 159 lb. The following scale of charges fully explains this and deserves attention:—

Management rate per package, subject to an uniform discount of 10 per cent.

GROSS.—160 to 199 lb., 2/9; 130 tb 159 lb., 2/3; 90 to 129 lb., 1/10; 80 to 89 lb. 1/8; 60 to 79 lb., 1/5; 45 to 59 lb., 1/2; 35 to 44 lb., 1/-; 17 to 34 lb., -/7.

MARKS ON CHEST.—Nothing is wanted or is of any service here beyond (1st.), Garden Mark; (2nd.), Description of tea; (3rd.), Garden Numbers. Gross, tare, or net, are not of the least use, and should be discontinued.

METAL PACKAGES.—Although not especially objected to, these do not yet find generally favour with buyers.

PACKING SMALL BROKENS AND DUSTS.—Special care should be taken to pack broken descriptions, which are so liable to lose in weight, in strongly made wooden packages. Dust should only be packed in half chests, either of metal or of strong iron hooped wooden packages; canvas coverings should in no case be used, as they disguise injury done to the packages by rough handling, and any tea retained in the canvas becomes of no value,

INDIAN PATENTS.

Whereas the inventors of the undermentioned inventions have respectively failed to pay the prescribed fees, it is notified that the exclusive privilege of making, selling, and using the said inventions in British India, and of authorizing others so to do, has ceased :—

IMPROVEMENTS IN THE MANUFACTURE OF TEA LEAF INTO BLACK TEA.—No. 158 of 1892.—Samuel Cleland Davidson's invention for improvements in the manufacture of tea leaf into black tea. (Specification filed 14th October 1892.)—*Indian and Eastern Engineer*, Jan. 30.

COFFEE PLANTING IN NYASSALAND, B. C. AFRICA.

(*From an ex-Ceylon Planter.*)

Mlanji, B.C.A., Dec. 8.

Our dry season this year has been very hot and trying for our coffee. Most of our blossoms in November which is usually our best has failed, consequently our crops will be short. Although we had a lot of rain, it was badly distributed; it was late in coming and we had almost two months dry with a blossom hanging in spike all the time. I have not (during my six years in Nyassaland) known such a bad year during our blossoming season. Our rainy season usually begins about the middle of November, but this year we have been anxiously looking for the rain to date, and just as I am writing thunder and lightning has begun and it rains in torrents. I only hope it will continue so that we may secure the little crop we have left, and make some decent wood for next year, for we have had a terrible scorching.

COFFEE AND TEA IN AMERICA.

REVIEW OF 1896.

COFFEE.

Coffee opened January 2 at 14¼ cents for No. 7 Rio, ruled comparatively steady until June, when a downward movement began, which carried the price to 9¾ cents in November, and left it at 10⅛ cents on December 31.

The high prices of the past ten years stimulated the setting out of new plantations in Central and South America, the full influence of which was not felt until the size of the crops of 1895-96 were known. For several years the world's requirements and the world's crops were so close to each other that prices were maintained at a high level until 1895, when they began to recede, and continued a downward movement throughout the past year, the closing price of No. 7 Rio being 4½ cents below that ruling January 1, 1896. The year 1896 is notable in that the increase in the crops of the world has been large enough in the crops of the world has been large enough to force a decline in the cost of Brazil sorts of over 4 cents per pound. The high prices which have ruled since 1886 stimulated the setting out of the new plantations all over the coffee belt of the world, particularly in Mexico, Central America, the United States of Colombia and Brazil. In 1795 the exports of coffee from the United States were 1,244,066 pounds greater than the imports. In 1896 the net imports were 572,971,840 pounds, valued at $83,534,366. The average value of imports was 14·6 cents per pound.

TEA.

Tea sold at the lowest prices ever made in this market until October, when it became certain there was a shortage in the crops of China and Japan, and prices advanced 2 to 3 cents per pound and held the gain until the close of the year.

Oversupply kept this market in a depressed condition until it became apparent that a large deficiency in the supplies for the present season, estimated from 20,000,000 to 23,000,000 pounds led to a large fall business and an advance of several cents per pound, most marked in medium and low-grade tea.

The year opened with Formosa Oolong steady, as receipts were limited, but Foochow and Amoy sorts were weak, as they were freely offered at auction, touching the lowest values recorded for cargo grades. Amoy, old crop, common to fair, sold in January at 7 to 8½ cents; Foochow, new crop, 9 to 10 cents; Greens, owing to the full supply, were in buyers' favour, Country teas and Pingsueys were freely offered at public sale; cargo Young Hyson sold at 7½ to 8½ cents; Twankay, 4¾ to 6 cents; extra first Young Hyson, Moyune, 25 to 30 cents; first, 15 to 19 cents; new crop Pingsueys were covered by prices ranging from 7 to 26 cents. During the spring the market ruled week, and prices fell below those quoted above on low-grade teas. All grades of Japan declined, and in May good medium brought 12½ to 13 cents; common to good common, 9 to 10½ cents; fine or finest, 14 to 15½ cents; choicest, 20 to 22 cents. During May from 4,000 to 5,000 half-chests Formosa, grading on superior, sold at private sale at 17 cents; common grades Foochow and Amoy at 7¼ to 7½ cents at auction.

In the fall it became evident that there would be a marked deficiency in the supply of Greens and Japans; aggregating 13,000,000 to 15,000,000 pounds for the seasons 1895-97. There was considerable speculative buying, and low grades advanced 1½ to 3 cents per pound in October, and have held the gain up to the present. From October to November 15 the sales in first hands covered 18,000 packages Japan; 3,000 Country and 12,000 Pingsuey Greens; 15.000 Formosa; 7,000 Foochow; 10,000 Amoy and 6,000 packages Congou. This proved the largest wholesale business in tea outside of the auction room, for the same period, in two years.

The year closes with demand slow, but with the statistical position strong, as the estimated supply for 1895-97 is about 12,000,000 pounds less than requirements, which may be fairly estimated at 93,000,000 pounds, while the estimated supply for the present season is placed at 82,350,000 pounds.

In 1796 the net imports of tea into the United States were 2,355,755 pounds; one hundred years latter (1896) they were 93,340,248 pounds. The per capita consumption is smaller now than from 1880 to 1882 inclusive, and less than from 1886 to and including 1889, since which date it has not varied one-tenth of a pound. The reason—large importation of trash.

The imports, re-exports and net imports of tea, the latter representing consumption, were for the year ending June 30, 1896, as follows:

	Pounds.	Dollars.
Imports	93,998,372	12,704,440
Exports	658,124	118,699
Net imports—Consumption	93,340,248	12,585,741
Per capita consumption ..	1·33	
Average imp. cost per pd.		13·50c.

The above quantity of tea was imported from the following countries:

	Pounds.
China	49,178,277
Japan	38,169,652
United Kingdom	2,729,695
Other parts of Asia	2 363,676
East Indies	1,261,671
Other countries	295,401
Total ..	93,998,372

China furnished 52 per cent. and Japan 40·5 per cent of the total imports.—*American Grocer*, Jan. 6.

ROYAL GARDENS, KEW.—Bulletin of Miscellaneous Information, May and June. Contents:—Botanical Enterprise in British Honduras, Sugar-Cane Disease in British Guiana, Hand-list of Coniferæ grown in the Royal Gardens, Tropical Fodder Grasses (continued), Cotton in British Central Africa, Sisal Cultivation in the Turks and Caicos Islands, Sacred Tree of Kum-Bum, Miscellaneous Notes.

COFFEE NOTES FROM NYASSALAND.

Coffee prospects for the coming season are good' We are informed that the heavy rains in the end of October brought out a good blossom. and there has since been pleasant sunny weather, which has in most caused it to set well.

A coffee plantation, which we think we are right in describing as the first which has been started in the districts west of Lake Nyasa, is now being formed by Mr. Kahu of Kotakota. He informs us that he expects to have 100 acres in before long. It has always appeared to us somewhat singular that none of the planters in this country have as yet opened up plontations in the districts lying immediately west of Lake Nyasa, even right to the north end. Water oarriage is so cheap, compared with land transport in this country, that coffee could probably be transported from Karonga to Matope as cheaply, or nearly so, as it could from Southern Angoniland to Matape, and by choosing a district in which labour is cheap, as indeed it is in almost all of the Nyasa Districts, the cost of production would probably, in the first instant at any rate, be very much less than it is in the Shire Highlands.—*British Central Africa Gazette.*

INDIAN TEA COMPANIES.

To the Editor of THE "FINANCIAL TIMES."

Sir,—Your article about Indian tea companies seems to have drawn some attention to them, judging by the inquiries addressed to men who, like myself, are supposed to know all about their position and prospects. May I, therefore, say a word by way of guidance, to point out that discrimination should be used by investors, as a very distinct movement is in progress tending to enhance the value of one class of property and to depreciate another? The average of profits of past years is not always a reliable guide to the future profitableness of the estates, inasmuch as the value of the produce from certain districts is steadily appreciating while that of others is declining, This is due to the fact that only a certain amount of land in India, and very little in Ceylon is found to be capable of continously yielding fine tea, with the result that practically all the increased production of recent years is of a lower quality, for which the market value is falling unpleasantly near cost of production. A further rise in exchange and freight, added to the increased cost of feeding coolies at a loss on the rice and the continually growing difficulty of obtaining the sort of coolie required, would certainly reduce the profit of some concerns to a very low point. There will, of course, be a setoff in the check given to further extensions of the area planted. On the other hand, there is apparently no limit to the prices obtainable for tea from the finest plantations in Darjeeling and Assam. It is not my purpose to specify any company, but any stockbroker can obtain information by coming to a tea broker. This leads to a comment on what is a matter of general experience—namely, that if a client asks his stockbroker what he thinks about Indian tea, the answer is nine times out of ten that he "doesn't like it" with the advice to "leave it alone," sometimes followed by a suggestion to take a few shares in some wild-cat land company. Hence it is that during the last few years several tea brokers have started a stock and share department for their speciality, and are reputed to be making incomes that would make many a man in the "House" rich. A market has, in fact, been established with success independent of the Stock Exchange. I will conclude by adverting to the real grounds of the confidence in the best class of tea plantations shown by those who have been connected with this industry for a lifetime —to which you did not allude. They are:—

1. That such a thing as a failure of a tea crop (as distinct from its failure to be highly profitable) is unknown,

2. That there is no visible limit to the world's consumption, which steadily grows, as some think, because, in spite of doctors, it is found that the tea of British India is a food as well as a drink, nourishing and stimulating at the same time.

Just look at these figures. Consumption of tea per head per annum—Australasia, 7½ lbs; Great Britain and Canada, 5 lbs; United States abont 1¼ lb—the rest of America, Europe, and Asia from 1 lb to nothing per head per annum. What a field there is for a trader with the reai tbing in his store to push trade to dimensions hitherto undreamed of! And it is being done by the new tea-man owning a proprietary mark with an unpronounceable name, by means of a showy packet containiug the genuine article.—I am, &c., BROKER.

THE FORMATION OF SAND DUNES.

[? A LESSON FOR HAMBANTOTA.]

At the meeting of the British Association at Liverpool Mr. Vaughan Cornish contributed one of tho most valuable and original papers read to the Section, in the form of a practical study of the formation and distribution of sand dunes. He said that in the sorting of materials by wind the coarser gravel is left on stony desert or sea-beaches, the sand is heaped up in dune tracts, and the dust (consisting largely of friable materials which have been reduced to powder in the dune districts itself) forms widely-scattered deposits beyond the limits of the dune district. Three principal factors operate in dune tracts, viz., (1) the wind, (2) the eddy in the lee of each obstacle, (3) gravity. The wind drifts the fine and the coarse sand. The upward motion of the eddy lifts the fine-sand, and co-operating with the wind, sends it flying from the crest of the dune. The backward motion of the eddy arrests the forward drift of the coarser sand, and thus cooperate with the wind to build the permanent structuro of the dune. Gravity reduces to the angle of the rest of any slopes which have been forced to a steeper pitch either by wind or eddy; hence in a group of dunes the amplitude cannot be greater than (about) one-third of the wave-length. This limit is most nearly approached, owing to an action which the author explained, when the wind blows alternately from opposite quarters. Gravity also acts upon the sand which flies from the crests, causing it to fall across the stream lines of the air. To the varying density of the sand-shower is due the varying angle of the windward slope of dunes. When there is no sand shower the windward becomes as steep as the leeward slope. When the dune tract is all deep and the lower part of the eddy gouges out the trough, and, when the sand-shower fails, the wind by drifting and the eddy by gouging, form isolated hills upon a hard bed. In a district of deep sand, negative dunes ("Suljes") may be formed. The encroachement of dune tract being due not only to the march of the dunes (by drifting) but also to the formation of new dunes to leeward from meterial supplied by the sand-shower, it follows that there is both a "group velocity" and a "wave velocity" of dunes. Since the wave velocity decreases as tho amplitude increases, a sufficiently large dune is a stationary hill, even though composed of loose sand throughout. Where material is accumulated by the action of tidal currents, forms homologous with the ground plan of dunes are shown upon the charts. The vertical contours and the movements of subaqueous sand dunes are conditioned by the different tactics of sand-shower and sand-drift.—*Nature.*

THE DIMENSIONS OF TREES.

Your comparison between the heights of St. Paul's Cathedral, the spire of the dome of Cologne and the *Eucalyptus amygdalina* are extremely interesting; but, whereas the heights of those buildings are correctly known, that of the tree is, to say the least, problematical. No doubt Baron Von Mueller in some of his earlier publications claims the enormous length quoted for some of the trees measured by him, but it is generally understood in Australia that those measurements were made of old fallen

trees portions of which had been destroyed by bush-fires, and it is considered quite feasible that in this way the trunk of one tree and the crown of another supplied the data, the intervening portion being added and destroyed by fire.

The fact remains that, so far as I am aware, the extreme proportions quoted have never been found to exist by Forest officers of the Colonial Governments who examined the forests, though some of the mightiest kings of the forest have been carefully preserved by them. The measurements of Big Ben, or Big Beg, I am not sure which, is growing in the Melbourne water-supply reservoir, and which is considered the king amongst the lords of the forests, are well known. I forget what they are said to be, but as given to me they fall far short in length of those quoted in your extract, which failing further, verifications of their accuracy, cannot be accepted as authoritative.

10th December 1896. A FORESTER.

—*Indian Forester*, for Januray.

INDIAN PATENTS.

Specifications of the undermentioned inventions have been filed under the provisions of the Inventions and Designs Act of 1888 :—

Drying and warming oil-seeds by steam-power.—No. 118 of 1896.—Temulji Dhanjibhai, mill manager, of No. 125, Hurrogunge road, Sulkea, Howrah, for drying and warming oil-seeds by steam-power, (Specification filed 31st October 1896.)

Packing Tea.—No. 169 of 1896,—Henry Sabow (the late), some time engineer of Kurseong, Darjeeling, for packing tea, the invention being called "Sabow's Patent Vibrating Tea Packer." (Specification filed 16th January 1897.)—*Indian and Eastern Engineer*, Feb. 6.

PROGRESS IN B. C. AFRICA.

DEPUTATION FROM THE BRITISH CENTRAL AFRICA CHAMBER OF COMMERCE.

On the 23rd November a deputation from the B.C.A. Chamber of Agriculture and Commerce interviewed Mr. Sharpe, the Acting Commissioner, at the Court House, Blantyre. There were present :—Messrs. Israel (planter and merchant), Duncan (representing Messrs. Gardiner & Co., coffee brokers, merchants, &c., London, and also the firm of Buchanan Brothers), Beaton (acting manager of the African Lakes Corporation), Macrone (Civil Engineer), Hastings (planter), and Paolucci (planter and merchant).

SHADE TREES FOR COFFEE.

Mr. Israel also stated that a misunderstanding had arisen with regard to their letter to the Acting Commissioner referring to the importation of shade trees from India. They had no wish to import trees from districts infected with coffee leaf disease, but wished the Commissioner to enquire of the Government of India whether there would be any risk in importing shade tree seeds from certain districts of India.

ANALYST OF SOILS.

He also stated, in speaking of the appointment of a Government Analyst, of soils, that Sir Henry Johnston had expressed himself favourably about it. He spoke of the advantages which would accrue from the appointment of a Government Analyst, and of the possibility of the discovery of phosphates, &c., and trusted that a sum might be set aside for the appointment of a Government Analyst. He thought the expense might even be met by the fees charged.

RAILWAY.

Mr. Israel said, it had been proposed by the Chamber to call a meeting on the 4th December and pass certain resolutions which they would ask the Commissioner to forward to the Home Government with reference to the proposed railway.

Mr. Macrone produced plans of the alternative route and explained that although the gradients were steeper than by the first proposed route, the line was four miles shorter and would save about £2,000 in construction, but he would recommend the original capital to be adhered to (£200,000). He said that what they hoped Government might do was to guarantee a dividend of 3 per cent for a few years. Mr. Macrone had estimated the line would produce 1½ per cent at first, and they wanted the Home Government to guarantee the remaining 1½ per cent probably amounting to a sum of about £3,000 per annum. This was a very small sum, while the benefits to the colonists would be very large. They considered that in the face of the large Uganda vote, the settlers in British Central Africa who had exploited a new country, established a new industry, and proved its success, were entitled to ask for some small assistance in the railway question. The trade for a railway in British Central Africa already existed, and would pay a dividend now and would largely increase with railway facilities.

LABOUR REGULATIONS.

Mr. Paolucci stated that in his opinion there was not sufficient safeguard in the Labour Regulations against labourers deserting their work before their time was finished.

Mr. Hastings said that planters object to the Labour Regulations fee of 1s.

After some discussion about the cash paymeat of taxes Mr. Israel mentioned Sir Harry Johnston's last official Report on B.C.A. taking exception to certain paragraphs concerning the payment of labourers.

In replying to the foregoing observations made by the various gentlemen on the deputation, Mr. Sharpe said that Lord Salisbury had not definitely declined to do anything in the way of helping a railway, but that he had stated that the Foreign Office could not consider the proposals until a definite scheme was placed before them.

He proposed to get all information possible from the Government of India with regard to shade trees, and asked the Chamber to formulate their wishes in this respect in a letter.

With regard to an analyst, he recognised the importance of the agricultural interests in the future of this country, and would convey to the Home Government the feeling of the Chamber in this matter. He would endeavour to make some provisions for a Government Analyst coming out, and if, as he was informed, Sir Harry Johnston had expressed a favourable opinion, he had little doubt the matter could be arranged, but not till next year.

It was true that the Ocean mail service was not satisfactory. The Home Government was aware of the facts and recognised our difficulties in this respect out here. The question had also arisen at home in the beginning of the present year. We required a fixed service at regular dates to Chinde; and he had some hopes that before long something might be done in this direction.

With regard to the Shire Highland proposed railway, Mr. Sharpe said there would be little gained by his forwarding indefinite resolutions. The Home Government had already stated that it would be impossible to consider the matter until a definite scheme was submitted. They should meet and form a committee to go into details, prepare careful plans and estimates, and make the whole thing as complete as possible. Government would want to know to whom it was proposed that such guarantee should be made. Their best policy would be to form a definite scheme and he would submit it to the Foreign Office. He had heard that, with regard to the existing schemes, some amalgamated arrangement had been come to by the promoters at home.

Regarding the Labour Regulations, these were drawn up with the view of instituting a formal agreement between the employe and the employer, and there was no doubt that the act of registration was now looked upon by the labourers as a necessary formal preliminary. The registration fee of one shilling was small. In some countries it was as high as 10 shillings. Collectors were always ready to

assist in endeavouring to find and return labourers who had broken their agreements and run away before the completion of their time. These regulations were framed quite as much for the protection of the labourer as the employer. He did not think they had much to complain of in the matter of the Labour Regulations, which were working well.

Referring to Sir H. H. Johnston's last official report on B. C. A., Mr. Sharpe felt sure that the Commissioner had no intention of suggesting (as they seemed to consider,) that labourers were unfairly treated by employers in this Protectorate, but that the labour regulations were so framed by him that [ofi] dealing was secured for both employer and [equrer].—*British Central Africa Gazette.*

PRODUCE AND PLANTING.

THE SHARES OF CEYLON TEA COMPANIES.—As a set-off to the outcry in some papers against tea shares and the absurd talk about "booms" and investment in tea companies being overdone, the *Echo*, in its money article, has something to say in favour of Ceylon companies. After giving the price and the yield per cent of some of the better known companies, similar to that which appears in our columns week by week, our contemporary states that "investors who have hitherto held aloof from these shares may see what a far better holding they have proved to be than gold or silver mines. Yet a company like the Barnato Bank can obtain its millions of pounds without a prospectus in a few hours, and can find hundreds of small capitalists ready to sell out of Consols in order to pay £4 for a £1 share, while it has taken these same people six or seven years to be persuaded into buying Ceylon tea shares which were at one time obtainable at par, and which have ever since their formation as limited liability companies paid handsome and steady dividends. The rise in value of the Eastern Produce and Estates Company is remarkable," says the writer of the article, "when one remembers that this Company is the successor to the old Ceylon Company, Limited, which was brought down during the years 1880 to 1884 by the utter failure of the coffee crops. At the time of the first suspension of the Oriental Bank in April, 1884, the Ceylon Company, Limited, owed the bank a sum of about £570,000. Indead, the bank and the Company were so mutually involved in each other that they were bound to fall together. With the rise of other tea planting the Eastern Produce Company has risen also. Its 10,000 acres under cultivation represent some of the finest old coffee properties in the island, as well as some of the largest Rothschild Estate in Pussellawa and Meddecombra Estate in Dimbula were almost the best-known coffee plantations in the Central Province, the former having been successfully worked for nearly forty years before giving out. This company's debentures must be well secured, and should prove a suitable purchase for anyone desirous of holding an actual mortgage as well as a share in profits."

INDIAN AND CEYLON TEA IN THE UNITED STATES.—The *American Grocer* bears testimony to the success which is attending the efforts of Messrs. Blechynden and Mackenzie towards popularising Indian and Ceylon teas in the United States. The prejudice against these teas is giving way, and dealers who formerly prognosticated the failure of any attempt to place them on the market o anything like a large scale now admit that the growth of the trade is marvellous, and will continue to grow.

PACKET TEA.—The growth of the tea planting industry has been accompanied by a similar development of enterprise in regard to the packet tea trade. Those concerns whose proprietors have had faith in the value of advertisements and also the necessary capital to spend on this all-important department have found the packet tea trade pay, and the extent of the business is considerable. In their report, recently issued, the directors of the Mazawattee Tea Company, Limited, statethat they have thought it wise in this year's accounts to provide for the whole of the exceptional expenses in connection with the opening up of new business in fresh centres, including development outlay in Ireland, so that they have been entirely written off this year's profits. The net profit, after providing for these payments, is the sum of £54,270 2s 5d; and after payment of the managing director's remuneration, directors' fees, preliminary and office expenses and other charges and interest, making the necessary reserve for discounts, and for depreciation of leases and plant, there remains a balance available of £31,613 6s 5d. From this is to be paid the dividend due upon the prefereuce shares at the rate £5 per cent. per annum, which will absorb £4,476 15s; and the directors recommend a dividend upon the ordinary shares at the rate of £8 per cent. per annum for the half-year ending December 21 last, which will amount to £13,533 6s 8d. They propose to set aside out of the profits of the current year the sum of £12,000 as a reserve, and, after making this provision the amount of £1,604 4s 9d will, subject to such sum as may be voted for the commission of the directors, form the balance to be carried forward to the next account.

IN PRAISE OF TEA.—In an article on tea drinking, which appears in the *Globe*, the writer says:—"We can scarcely in the present day conjure up the vision of a tealess world. Yet our stalwart ancestors drank ale to their breakfast; and even when their overnight potations had been deep were constrained to call for 'small beer.' Modern civilisation has provided substitutes for these refreshments and our less robust age revolts at the idea of them. But modern civilisation has done more than give us substitutes; it has supplied us in the tea-table with an institution whereof no prototype exists. The glories of the punch-bowl have departed; the guinea-decorated ladle is profaned to the service of various degenerate and soulless compounds known as 'cups'—it is enough to make our convivial great-grandfathers turn in their graves. The hospitable mahogany has its cheerful surface veiled with a cloth, and might as will be simple deal; but we maintain in its perfection the rite of tea-drinkining. It is not a rite of such dignity as those practised by our forefathers; the teapot soothes rather than elevates; it is domestic rather than convivial; its function is not so much to create a bond of unity between an assembly as to supply a solace to the individual. But such as it is unequalled. Moreover, tea is a link between all classes of society; for it no longer costs, as in the times when fashionable society rhymed it to 'obey,' twenty shillings in the pound. It sheds its grateful influence upon palace and cottage alike; it is no longer merely an 'elegant regale'; it has become popular, and that without losing its charm."

THE TEA INDUSTRY.

INDIAN AND CEYLON IMPORTS.

Year by year the growing importance of British-grown tea is showing itself in statistics and Board of Trade returns. If the official Britons take money out of India and live at home in something resembling ease, it can at least be urged that the commercial Briton takes his capital out to the East, where he often lives in considerable discomfort, working hard himself, and employing native labour by the hundred thousand at a time.

The official prays for a rise in exchange, and considers that he is being robbed with every fraction that it declines. The planter, or capitalist, employed in the tea enterprise would be glad enough to see the Rupee down to a shilling, as any gold he sends out to India to pay for the opening up of more jungle land becomes nearly doubled *en route*, while the product grown on the estates is shipped to London and sold for gold.

Subjoined are the imports of tea into the United Kingdom from the 1st January to the 31st December 1896, as shown by the Custom House returns, together with the figures for the two previous years. The first line (a) relates to British India, the second (b) to Ceylon, the third (c) to China, and the fourth (d) to all o'her countries, including Java and other Dutch settlements.

	1894.—Lb.	1895.—Lb.	1896.—Lb.
(a) ..	118,400,000	123,300,000	128,800,000
(b) ..	76,300,000	83,400,000	94,600,000
(c) ..	43,900,000	40,000,000	35,200,000
(d) ..	5,600,000	8,400,000	7,400,000
	244,300,000	255,300,000	266,000,000

Thus, while China imports havo steadily declined from 43,000,0000 lb. to 35,000,000 lb., those from Ceylon have risen from 76,000,000 lb. to 94,000,000 lb.—*Echo*, Jan. 23.

CEYLON TEA IN CANADA.

Mr. Mackenzie, our American Tea Delegate, in communicating with us by a recent mail, sends us the following extract from a letter he had received from the Salada Ceylon Tea Company :—

"The *Canadian Grocer* of this week made a bad mistake. They stated that there were 'ten million' pounds of tea imported in that year, 1895. They must have given the returns for the Province of Ontario instead of the Dominion of Canada, as thore were twenty-three million' in 1894. I am enclosing you a page with it in. I have just called their attention to it, over the phone.

"You will also notice an article on that page about the Japanese gentleman who was interviewed in Montreal a day or two ago."

The extract from the *Canadian Grocer* is as follows :—

DUTY ON TEA AND RAW SUGAR.

"If I could only foresee what the Government intends to do, I could make a barrel of money," said a leading Montreal wholesaler to the Candian Grocer this week.

Thie expression sums up the situation in a sentence. There is a pretty general impression that a duty on both tea and raw sugar will be among the methods that the Government will adopt to make up for decrease in revenue caused by readjustment in other directions. But though this belief is general throughout the tradet it has so far failed to induce any buying as far as Montreal is concerned either of tea or sugar in anticipation of profiting by the change.

From the opinions generally expressed by the Montreal jobbers, they would all welcome a duty on tea. With a duty they think that it would sensibly reduce the impertations of low-priced Japan and China tea into Canada.

As is well known, the great bulk of the tea turned over in Montreal costs from 10 to 15c. in a wholesale way.

In the old days of the duty, with 7c. per pound and 15 per cent. and valorem on Japans and greens, and 4c. per pound and 15 per cent ad valorem on blacks, it hardly paid to import these very low-grade teas, hence their consumption has enormously increased since tea imported direct was made free.

No trader is prepared to specify what the duty should be, but many declared that thoy would not object to a specific duty of 5c per pound on all teas and a certain ad valorem charge. They figured that the increased cost to the consumer would not be of the kind that is keenly felt, while it would be one of the quickest means of the Government's securing the increase in revenue that it requires.

During 1895 thero were 10,083,310 pounds of tea entered for consumption in Canada. This will afford some idea of the increase in revenue the proposed duty would bring in. With regard to raw sugar, on which many expect that the present duty will be maintained or increased, 309,302,296 pounds wero entored for consumtion in 1895.

The other article we will quote in another issue.

THE CLYDE TEA ESTATES COMPANY, LIMITED.

The annual ordinary general meeting of shareholders was held at the office of the Secretaries Messrs. Lewis Brown & Co., Fort, at noon on the 15th Feb. when the following were present personally or represented:—Mr. R Lewis M. Brown (in the chair) Messrs. Frank M. Laurie, W. Forbes Laurie, G. H. Ansten, Leybourn Davidson, Robert Davidson, Mrs. Holdich, and Mr. A. VanReuen.

After the notice calling the meeting had been read, the Chairman moved the adoption of the report and accounts as published. This having been duly seconded and carried, the payment of a final dividend to 31st December 1896 payable on 1st proximo was formally proposed and agreed to.

The re-election of Mr. Frank Laurie as a Director and of Mr. Hercules J. Scott as Auditor concluded the meeting.

The Directors' report was as follows :—

ACREAGE.

Tea in full bearing	..	460	acres.
,, ,, partial ,,	..	61	,,
Jungle, &c.	..	172	,,
Total..		693	

Your Directors beg to submit their Report and Accounts for the season running from the formation of the Company, viz :—1st October, 1895, to 31st Dec. 1896.

The quantity of tea made during that period (including bought leaf) was 220,884 lb. which realized R93,931·07, an average of 42·53 cents per lb.

An Interim Dividend of 5 per cent absorbing R13,500 was paid on 5th August, last and the sum now available for distribution after writing off R1,122·34 on account of Preliminary Expenses and R1,161·35 for depreciation of Machinery is R9,155·86, out of which the Directors recommend payment of a final dividend of 3 per cent leaving 1,055 86, to be carried forward to 1897.

The Working Expenditure during the period now accounted for was in excess of the estimated amount, and, while the Directors much regret this, they will endeavour to prevent a similar excess in future.

On his departure for Europe in October last, Mr. A. VanReuen handed over the Estate Superintendence to Mr. M. J. Alderson, whose management of the property is giving much satisfaction.

The prospects for the current year are good, and with normal weather and prices the shareholders may confidently antic'pate a very favourablo return.

Mr. E. D. Harrison having left for Europe in October last, his placo as a Director was filled by Mr. Leybourne Davidson. Mr. Frank M. Laurie retires from the Board by rotation, and being eligible offers himself for re-election.

CEYLON PATENTS.

The following Grants of Exclusive Privilege have been granted under the Inventions Ordinance, No. 16 of 1892, during the half-year ended December 31, 1896 :—

No. 504.—To William Jackson, of Thorn Grove, Mannofield, Aberdeen, North Britain, engineer, for improvements in or connected with machinery or apparatus for drying tea leaf or the like.—July 7, 1896.

No. 505.—To William Jackson, of Thorn Grove, Mannofield, Aberdeen, North Britain, engineer, for improvements in or connected with webs, trays, flaps, or carriers, for carrying tea leaf or other substances in drying machines.—July 7, 1896.

No. 492.—To Dick Edward Radclyffe, of 56, Gloucester Crescent, Regent's Park, London, England, gentleman, and Taylor Burrows, of 88, Upper Kensington lane, London, England, engineer, for improved apparatus or method or system for proparing

chena grass or rhea fibre or hemp, or similar fibres for combing or spinning.—July 7, 1896.

No. 462.—To George Murray Collom, engineer and tea planter, care of W. G. Forbes, Esq., Her Majesty's Mint, Calcutta, for invention for improved patent tea sorting and sifting machine for tea or grains, &c., to be called Collom's Patent "Acme" tea sorting machine.—July 9, 1896.

No. 503.—To Samuel Cleland Davidson, of Sirocco Engineering Works, Belfast, Ireland, merchant, for improvements in the trays or carriers of apparatus for exposing tea, coffee, cocoa, grain, and other substances to the drying or other action of air, vapour, or gases.—July 23, 1896.

No. 493.—To Samuel Cleland Davidson, of Sirocco Engineering Works, Belfast, Ireland, merchant, for improvements in tea rolling machines.—August 21, 1896.

No. 501.—To Bruno Wesselmann, engineer of Gottingen, Frieland, Weg 45 in the German Empire, for improvements in or relating to drilling or boring tools.—August 21, 1896.

No. 496.—To William Walker, the younger, of Birmingham, England, electrician, and Frank Richard Wilkins, of Handsworth, England, chemical merchant, and Jabez Lones of Smethwick, England, manufacturer, for improvements in primary Voltaic batteries.—Septemper 1, 1896.

No. 508.—To Samuel Cleland Davidson, of Sirocco Engineering Works, Belfast, Ireland, merchant, for improvements in tea leaf rolling machines.—September 17, 1896.

No. 507.—To James Thomas Hawke, of Orion estate, Gampola, and Charles Northway, of Deviturai, Elpitiya, in the Southern Province of Ceylon, planters, for improvements in machinery or apparatus for a tea cutter.—September 26, 1896.

No. 509.—To Sydney Lawrence, of 159, Queen street, Melbourne, in the County of Victoria, Australia, engineer, for improvements in mechanism for and mode of marine propulsion.—October 10, 1896.

No. 514.—To Henry Bingham, of 365, Mount Alexander road Ascot Vale, in the Colony of Victoria, Australia, dentist, and John Alston Wallace, of Ludstone Chambers, Collin street, Melbourne, in the Colony of Victoria, Australia, for improvements in bicycle and like tyres.—November 13, 1896.

No. 511.—To Samuel Cleland Davidson, of Sirocco, Engineering Works, Belfast, Ireland, merchant, for improvements in tea equalizing or cutting mills.—November 30, 1896.

No. 512.—To Samuel Cleland Davidson, of Sirocco Engineering Works, Belfast, Ireland, merchant, for improvements in aparatus for filling tea or other substances into chests or the like while being packed.—Nov. 30th, 1896.

No. 515.—To Herman Frasch, of Euclid avenue, corner of Kennard street, in the City of Cleveland, in the County of Cuyahoga and the State of Ohio, one of the United States of America for improvements in mining gold and similar metals.—Dec. 15th, 1896.

No. 518.—To John Coryton Roberts, of 16, Cromwell Grove, West Kensington, in the County of London, England, planter for improvements in the manufacture of tea chests and other packing cases or boxes.—Dec. 24th, 1896.

No. 523.—The Pennington Motor Foreign Patents Syndicate, Limited, of 5 and 6, Great Winchester street, London, England, for improvements in explosion engines.—Dec. 24th 1896.—*Gazette.*

BRITISH HONDURAS.—The products of our cultural industries, still really in their infancy, are chiefly represented by bananas, plantains, coconuts, coir, coffee, henequen, Indian corn, limes, mangoes, oranges sour and sweet, pineapples, avocado pears, rubber, to which there should be added, in time, anatto, cacao, groundnut, indigo, jute, ramie, spices, manila, and doubtless other marketable commodities.—*Kew Bulletin.*

VISIT OF A JAVA ESTATE PROPRIETOR:—

COFFEE,—CACAO,—TEA.

Mr. Van Sohn—the owner of extensive tea, coffee and cinchona property in Java, who has just closed a brief visit to our planting districts,—is an exceptionally bright intelligent Dutchman, speaking English admirably and entering with gusto into all modern improvements connected with a planter's life. In his Tea Factory in Java he has a turbine developing 24 horse-power, half-a-dozen rapid rollers, 3 or 4 Britannia driers, and all needful accessories, and he has just bought a Roll-breaker at the Colombo Iron Works. His factory and bungalow are lighted with electric light, and that he and his partner are fully alive to the difference between high and low prices and coarse and fine plucking may be judged from the fact that while in 1895, as much as 595,000 lb. of tea was made in his factory, for 1896 the return is only 330,000 lb. from the same acreage of 550 acres—chiefly due to finer plucking, though partly to a drier season. Mr. Van Sohn's prices have gone up to 11½d per lb. and he can turn out his tea for 3½d per lb. (but that perhaps was with the larger crop). He confirms our view that the basis of the Java Currency is a gold standard, though they use silver chiefly—exchange affecting the Java planters no more than 3 cents above and 3 cents below the 12 guilders they count to the £.—In coffee, fresh planting is confined to the Liberian variety in the older and more settled districts of Java; although in East Java, the Arabian variety is persevered with, notably by the Ceylon planters who are there interested. Mr. Van Sohn has only a few bushes of cacao: and he says the industry generally is not at all promising in Java any more than in Ceylon. Its worst enemy in Java is a boring beetle. Mr. Van Sohn's tea is chiefly in the lowcountry not more than 1,000 feet above sea-level, and helopeltis is sometimes troublesome, his only effective remedy being cleaning the stems of the bushes and letting in light and air generally.

Very important for Ceylon planters to know is the fact that Mr Van Sohn does not expect that the Java Tea Exports will increase by more than half-a-million lb. per annum for some years to come. Quite as interesting, too, is it to know that all the tea from Mr. Van Sohn's property goes direct to Holland and that successful efforts are being made to extend the consumption of tea (in place of coffee) in the Netherlands and Belgium.

Mr. Van Sohn, who, besides visiting Nuwara Eliya, passed through Dimbula and Dikoya to Maskeliya, was much astonished to see some of the soil in which tea grows and flourishes in Ceylon as compared with the rich deep volcanic soil of Java. "Even on little more than bare rock, tea seems to grow with you" is one of his remarks; but in such cases, the roots doubtless find their way unobserved far into a subsoil.

Without benefitting by exchange, Java planters prosper because of cheaper labour and a more regular supply and also we suppose, on the whole, through richer tea crops. Our visitor left last month by the French steamer for Singapore; and some day we trust to be able to look in upon him on his fine Java property and get an idea of the island generally with its great planting riches and capabilities.

LON HILLS TEA ESTATES CO., LD.

The annual general meeting of the shareholders of this Company was held on the 15th Feb. in the office of Messrs. Bosanquet & Co. Present :—Messrs. J. H. Renton in the Chair, W. W. Kenny, G. C. Walker by his Attorney Mr. J. W. Forbes, W. C. Brodie, A. V. Renton, A. W. Thenring, J. D. Balfour by proxy. The home shareholders were all represented by proxy. In laying the Directors' report and statement of the Company's accounts as for the 21st December last before the meeting, the Chairman explained how it was thatthe estimate of crop had not been fully realised and pointed out that better results might reasonably be expected this year. Mr. J. H. Renton proposedt he adoption of the report, Mr. Walker seconded and the motion was carried unanimously.

Mr. Walker proposed and Mr. Brodie seconded that a dividend at the rate of 5 per cent. per annum be paid. Carried unanimously. Mr. Unwin proposed and Mr. Brodie seconded that Mr. W. W. Kenny, the retiring Director, be re-elected. Carried unanimously.

STINSFORD TEA COMPANY.

The first ordinary general meeting of the shareholders of this Company was held on the 15th Feb. in the office of Messrs. J. M. Robertson & Co. Mr. W. Forsythe presided and the others present were Messrs. F. W. Bois and W. Moir by his attorney Mr. V. A. Julins.

The report of the directors was submitted as follows :—

The Directors have now to render their first Report and Accounts, being those for the season ending 31st December, 1896.

The quantity of tea received from the two Estates was 185,317 lb. which is considerably under the estimate, the shortfall being upon the Ivies estate, where the result of the year has been most disappointing. In consequence of a scarcity of labour at the commencement of the season pruning was unduly delayed. The Tea Factory also was not finally completed until the 30th of June and the crop for the first half of the year was manufactured in a neighbouring factory at a cost of 10 cents per lb. Prospects for the new season are favorable on both properties.

The Directors trust that then next annual Report will indicate better returns, as labour is now plentiful and the 1897 crop is estimated at 217,500 lb. of made Tea.

25 acres of young Tea upon Stinsford will be in partial bearing the latter half of 1897, and the 26 acres planted in 1896 with Nahaketti Indigenous is now growing satisfactorily.

30 acres of new land are being opened this year upon Ivies and the work is well in hand.

The result of the season shews a profit of R21,941·46, and the Directors recommend that a dividend of 6 per cent on the capital of the Company be paid, absorbing R18,000, and that the balance of R3,941·46 be carried forward to the next account.

In accordance with the Articles of Association all the Directors retire, but being eligible offer themselves for relection.

It will also be necessary to appoint an auditor or season 1897.

The report and accounts were passed and a dividend of 6 per cent was declared. The directors were re-elected and Mr. John Guthrie appointed auditor for 1897.

THE GLASGOW ESTATE COMPANY, LD.

TEA AND COFFEE.

The annual ordinary general meeting of shareholders of the above Company was held at the Company's Offices, No. 7, Queen Street, Fort, Colombo, on Saturday, February 13th, 1879, at 12 noon.

Present :—Mr. J. G. Wardrop, Chairman ; Directors ; Messrs. A. Thomson, Thos. Mackie, E. J. Young. The following shareholders were represented by their attorneys :—Mr. E. John by Mr. R. John ; Mr. G. C. Walker by Mr. Jas. Forbes ; Mr. G. W. Carlyon by Mr. A. Thomson; Mr. W. H. G. Duncan by Mr. A. Thomson.

Mr. Wardrop having taken the chair, the notice convening the meeting was read.

The report and accounts of the Company as published were adopted, and a final dividend of 9 per cent. was declared and made payable forthwith.

Mr. Alex Thomson was re-elected a Director and Mr. Hercules J. Scott was appointed Auditor for this year.

A vote of thanks to the Chair closed the proceedings.

REPORT.

ACREAGE.

Tea in full bearing	..	433 acres.
Do. partial bearing	..	157 „
Do. not in bearing	..	46 „
Grass ..	..	2 „
Jungle, &c. ..	..	76 „
Total Estate	..	714 acres.

The Directors have pleasure in submitting to the Shareholders the accounts of the Company for the past year.

The crops secured amounted to 232,013 lbs. of Tea and 260 bushels Coffee, as against 232,239 lbs. Tea and 562 bushels Coffee in 1895. The net average prices realized were 58·01 cents per lb. for Tea and R16·94 for Coffee respectively, as against 58½ cents and R18 respectively in the preceding year.

After making the usual provision for depreciation of Buildings and Machinery, the result of the year's working, including a small balance from 1895, shews a profit of R64,538·98, equal to about 19¾ per cent on the Capital of the Company, as against 21¾ per cent in the previous year. The reduced revenue is due to the smaller Coffee crop secured. This latter product having ceased to be profitable, the trees remaining on the Estate are now being cut out and larger returns from the Tea fields from which they are being removed will doubtless result.

An interim dividend of 8 per cent was declared on the 8th August last, and the Directors now recommend the payment of a final dividend at 9 per cent, making 17 per cent for the year. They further recommend that the sum of R8,000 be added to the Extension Fund. and that after payment of R200 extra fees to the Directors in terms of the resolution passed on 18th February, 1893, the balance of R1,088·98 be carried forward to the current year's account.

During the past year good progress has been made with the Turbine Installation referred to in the last Annual Report, and the Directors look for its completion during the current month. The work has been found to be much heavier than was anticipated, and as will be seen from the accounts now submitted, the sum expended under this head to 31st December last amounted to R26,696·94. It is expected that a further sum of about R6,700 will be required to complete the undertaking, the total cost of which the Directors suggest should be charged against the Extension Fund. The Capital Account outlay incurred during the past year amounted to R6,214·48 for additions to Buildings and Machinery and on the opening of a new Tea clearing of 15 acres in extent.

The estimates for the current year are 250,000 lbs. made Tea against an expenditure on Working Account of R67,597·50. It is proposed to open a further clearing of 15 acres during the year in connection with

which and with other items chargeable to Capital Account the outlay estimated under that head amounts to R3,005.

Messrs. G. W. Carlyon and C. A. Leechman having during the year resigned their seats on the Board, the remaining Directors appointed Messrs. Alex. Thomson and Herbert Tarrant to fill these vacancies respectively. In terms of the Articles of Association Mr. Alex. Thomson retires by rotation from the office of Director, but is eligible for re-election.

Mr. R.L. M. Brown having resigned the post of Auditor to the Company, the Directors under the Company's Article No. 92 appointed Mr. Hercules J. Scott to fill the vacancy thus occosioned.

The appointmeut of an Auditor for the current year will rest with the Meeting. By order of the Directors. WHITTALL & Co.

Colombo, Feb. 3rd 1897. Agents & Secretaries.

THE MADRAS AGRICULTURAL COLLEGE.

The ollowing questions by an unofficial member of the Madras Legislative Council and the answers of the Government are of interest in view of a similar proceeding which took place in the Legislative Council of Ceylon :—

COST OF THE AGRICULTURAL COLLEGE.

Q.—What is the approximate amount spent till now towards the maintenance of the Agricultural College and the Farm, &c., at Saidapet?

A.—THE HON'BLE MR. GROSE :—

12. The approximate cost comes to about 8 lakhs of Rupees.

BENEFITS FROM THE AGRICULTURAL COLLEGE.

Q.—In what way has the country beuefit by it?

A.—THE HON'BLE MR. GROSE :—

Among the benefits which the country has derived from the College of Agriculture may be enumerated—

(i) The spread of agricultural education.

(ii) The supply of trained subordinates for the Agricultural and Civil Veterinary Departmeuts.

(iii) The supply to the Revenue and Forest Departments of a number of subordinates who are acquainted with the theory and practice of agriculture.

(iv) Tho diffusion of a knowledge of improved implements, of stock and dairy management, of deep cultivatiou, of manure and of other matters intimately connected with improvement in agriculture through the agency of the students.

(v) The general awakening of interest in agricultural matters.

THE INFLUENCE OF THE AGRICULTURAL COLLEGE ON AGRICULTURE.

Q.—Has the agriculture of the country been in any way improved? If so, in what way?

A.—THE HON'BLE MR. GROSE :—

The question covers so vast a field that it is impossible for the Government to furnish the Hon'ble Member with a simple answer. So far as the Madras Presidency is coucerned, information in regard to such improvements as have been effected will be found in the published administration reports of the Departments of Land Records and Agriculture, to which the Hou'ble Member will be referred.

INADEQUACY OF AGRICULTURAL IMPROVEMENT.

Q.—Does not the Government think that steps hitherto taken towards the improvement of agriculture are not enough, and the ryots are too poor and helpless to improve it themselves?

A.—THE HON. MR. GROSE :—

The Government considers that further measures should be adopted from time to time for improving agriculture, and this difficult subject cousequently continues to engage its attention. The Government does not believe the ryots to be generally "poor and helpless"; but, ou the contrary, is convinced that, as a class, they are well able to take care of their own interests in this respect and will readily adopt improvments in agricultural methods which are brought to their notice when the advantage to be derived therefrom is demostrated to their satisfaction.

FACULTIES FOR AGRICULTURE.

Q.—Will the Government be pleased to adopt better measures than have hitherto been adopted for the pure pose, as for instance, of obtaining lease of ten to fifteen acres in each taluk from ryots, and prove by actual improved means of cultivation the advantage of the new system as a practical lesson to the owner of the land and his neighbours.

A.—THE HON. MR. GROSE :—

The Government does not consider the scheme suggested by the Hon. Member to be practicable ; but he will, no doubt, be glad to hear that orders have recently been issued directing the establishment for a similar purpose of an experimental farm at Bellary or Coimbatore. Should the working of this farm prove a success, the Government will, in all probability, establish others in different parts of the Presidency.

LANDS GIVEN UP AND BOUGHT BY CEYLON PLANTERS IN THE STRAITS.

The District Officer, Klang (Mr. W. W. Douglas), Reports :—

Block Nos. 32 and 33 on the Langat Road, recently surrendered by Mr. William Forsyth, form part of the areas mentioned above. The applicants are principally Javanese, but in block 32, which contains 64 holdings of about $4\frac{1}{2}$ acres, the applicants are Malays, Chinese and Tamils. Block 37 surrendered by Mr. T. N. Christie, is being alienated to natives in a like manner, and up to the end of the month 62 applications had been made leaving room for about eight more. Blocks 32 and 33 are at present being demarcated.

At the land sale held on 7th December, 15 blocks iu the Kapur Mukim, one in the Klang Mukim, and one in the Damansara Mukim, in all comprising 5,682 acres 1 rood, were offered for sale by auction at an upset price of $1 per acre. Of the 15 blocks in the Kapar Mukim six were sold, one being purchased by Mr. E. V. Carey for Mr. A. Orchard, three by Mr. A. D. Douglas for Dr. Graham and Bodo Von Bulow, one by Mr. T. Gibson for the Klang Planting and Estates Syndicate, Limited, and one by Mr. John Iuch, of Klang. One block in the Klang Mukim, between the 6th mile on the Langat Road and the Langat River, was bought by Mr. J. D. Toynbee for Colonel W. Ellis, and at Damansara a small block, No. 18 was bought by Mr. R. S. Meikle for Mr. T. N. Christie. In the sale of these blocks the upset price was realised.—*Selangor Govt. Gazette.*

LONDON PRODUCE CLEARING HOUSE.

REFERENCE TO CEYLON COFFEE AND INDIAN TEA: GOLD AND SILVER.

The yearly general meeting of the London Produce Clearing House, Limited was held yesterday (Jan. 25) at the Cannon-street, Hotel, under the presidency of Mr. Francis John Johnstou.—The Secretary (Mr. John Culbertson) having read the notice convening the meeting,

The Chairman said :—Gentlemen, When an increased dividend is proposed and when that dividend is the highest paid since the company was formed, we have a practical proof, more telling than words, that our business is progressive. This increased dividend is chiefly due to our larger dealing in sugar, in which the range of prices, from the highest to the lowest point, during the year, has been about 35 per cent. It is severe fluctuations like this that the security afforded by our system becomes specially evident, and this fact has not failed to impress itself strongly on operators through the stern logic of events. While we have secured to our clients in sugar, as in other articles, the due and prompt fulfilment of engagements, we have not only been able to do so without any loss, but also without a single dispute or case for arbitration, so smoothly has our business worked. In short, our operations have been conducted on the admirable business rule of safely, swiftly and pleasantly. While, however, sugar has

afforded us the fluctuations on which we chiefly live, our business in silver has been checked by the steadiness of its value. This may, however, be but a prelude to better things. For if the production of silver is to be reduced by its present moderate price, while that of gold increase by leaps and bounds, we may see the present relative position of the two metals changed by the natural laws of trade, provided, of course, present silver-currency countries do not abandon its use.

COFFEE, &C. AND SILVER.

There seems to be no reason why they should, as there can be no question that the trade of countries like Mexico, for instance, is being greatly advanced by the depreciation in silver, as wages there remain stationary, while much higher silver prices are being paid to producers, whereby a great stimulus is being given to the production of coffee and other agricultural products, which are now becoming leading articles of export, and which, when once developed, will remain so, even with a recovery in the value of silver. In Indian tea and in Santos coffee the new types have led to increased transactions, which it is to be hoped will prove permanent and progressive. We hear in some quarters, not well versed in business, of the depressing influence of speculation on the prices of produce· Yet those who are acquainted with the Continental sugar trade could tell you that refiners there have had to suffer from an insufficient margin between the prices of raw and refined sugar, a difficulty which can be explained by the fact that raw sugar, being the chief medium of speculation, has commanded a price above its relative intrinsic value. The law that the more current you make a thing the higher is its value is well understood on the Stock Exchange, where with securities identical as to intrinsic merits, that which is most dealt in always commands the highest price. There was a striking instance of this some 40 years ago, which some of us are old enough to remember, when native Ceylon coffee, being the medium for speculation, was always relatively dearer than plantation Ceylon, and was called the Consols of the coffee market, commanding even on some occasions a price equal to plantation, though intrinsically its inferior by many shillings per cwt. Make crystals and granulated sugar a medium for speculation rather than raw, and the refiner's position is at once improved. To ourselves it is naturally the same whether speculation fastens on raw or refined sugar so long as there is speculation which requires our system to keep it sound and wholesome.

AN UNASSAILABLE AXIOM.

It may further be laid down as an unassailable axiom—(1) That there will always be speculation, (2) that speculation is desirable in the interests of trade, and (3) that it is to the advantage of all that speculation should be kept sound and sober by the rules on which we act. It is on this rock that we stand, and we know, therefore, that our foundations are true. In the accounts there is nothing which seems to call for special remark. The investments are all taken at the prices quoted at the close of the year; since when any change has been to their advantage. Our American securities are all of the highest class, and being all in sterling, are free from the risk of currency experiments. Their quality is proved by the fact that they all stand at a premium, and that the railways whose bonds we hold are now able to borrow at rates much below the interest our bonds carry: in the case of the Pennsylvania and the New York Central at little more than half—say, at 3½ per cent, against 6 per cent, so there can be no question as to the payment of our bonds as they fall due. With these remarks I beg to move that the report and accounts be received and adopted. (Appaluse.)

Mr. B. D Tabor seconded the resolution, which was carried unanimously.—*Financial Times*, Jan. 26.

CENTRAL AFRICAN NEWS.

Mr. Alexander Whyte has, during the last ten days, been collecting zoological and botanical specimens on the top of Mlosa mountain and plateau. He reports that he has procured some interesting specimens, several of which he thinks are new to science. The top of Mlosa plateau consists of rolling hills covered with fine short grass, well wooded in the gullies and with a plentiful supply of water. The plateau is not quite equal in extent to the Zomba plateau, but lies at about the same elevation (between five and six thousand feet above the sea), and the scenery is even finer than that of Zomba. Access is obtained to the Mlosa plateau by more easy gradients than the Zomba plateau or that of Mlanje. At this time of the year Mr. Whyte finds the climate very pleasant.

The first foal bred in British Central Africa, the property of the Administration, is now two years old, and in a few months time it will be broken in. It would, we think, be very advisable for those who import horses to get in as many mares as possible, and in this manner by degrees to get a true Nyasaland breed.

VARIOUS PLANTING NOTES.

ROYAL GARDENS, KEW.—Bulletin of Miscellaneous Information, Appendix 1.—1897, contains list of seeds of hardy herbaceous plants and of trees and shrubs, which for the most part, have ripened at Kew during the year 1896. These seeds are not sold to the general public, but are available for exchange with Colonial, Indian, and Foreign Botanic Gardens, as well as with regular correspondents of Kew. No application, except from remote colonial possession, can be entertained after the end of March.

THE BULLETIN of the Botanical Department, Jamaica, for November 1896, edited by William Fawcett, B.Sc., F.L.S., Director of Public Gardens and Plantations, has for contents: Soil Ferments Important in Agriculture II; Micro-Organism's & Tobacco; Orchid for Naturalisation; Coccidæ or Scale Insects.—IX, Jaffa Orange; Ferns: Synoptical List.—XLII; Contributions to the Department; Castleton Gardens. Mr. R. Thomson's paper on the new orchid is interesting: have we *Odontoglossum crispum* in Ceylon?

COFFEE.—Mr. A. G. Beeston, brother of Mrs. Mackenzie-Steuart, has, I hear, accepted the post of Secretary of the Serapiqui Coffee Co., Ld., which has recently been formed for working the property in Costa Rica visited last summer by Mr. J. L. Shand. The capital for this venture has, I understand, been now subscribed, and Mr. Rothe, the vendor of the land, returns at once to Costa Rica to begin operations in earnest. The proceedings of this Company, and also of the Dumont Coffee Co., Ld., in Brazil, will be watched with much interest by all old Ceylon Coffee Planters.—*London Cor.*, local "Independent."

THE "INDIAN FORESTER," a Monthly Magazine of Forestry, Agriculture Shikar and Travel, edited by J. W. Oliver, Conservator of Forests, and Offg. Director of the Forest School, Dehra Dûn, for January 1879, has the following contents:—Original Articles and Translations: The American Resin Industry (Translation); Correspondence: What Constitutes a Thinning? letter from F. Gleadow; The Dimensions of Trees; letter from "A Forester"; The Official Designation of Forest Subordinates: letter from "Miles"; Review: The Forest Administration Report of the Jummu and Kashmir State for 1895-96; Extracts, Notes and Queries: The Grievances of the Forest Department; The Formation of Sand Dunes; Wealth based upon Elastic Gum; Wood Paving in Rangoon; Wood used by Cabinet Makers; Rudyard Kipling on the Indian Foresters; A Spider that eats Birds; Timber and Produce Trade: Churchill and Sim's Circular, December 1897; Market Rates of Produce; Average Selling Rates of Timber in the N.-W. P. in November 1896; Extracts Official Gazettes.

THE MANURING OF TEA ESTATES.

(Continued from page 570.)

The following is another instalment of the letters we have received in reply to our circular to representative planters asking information on the following points:—

1. Has the manuring of tea estates become general in all, or only in old, districts? or, if your experience is local, in your own district?
2. Is bulky manure chiefly used?
3. Is the manure sent up by railway used alone or mixed, and is there much of bone-dust and nitrates as well as of castorcake and fish manure now used?
4. Do you think harm is being done to any extent by the use of artificial manures in the case of tea?
5. How does the oldest manured tea compare with unmanured tea of the same age?

No. XXXVI.

High District, Jan. 7.

1. Manuring is general in all districts, probably fifteen to twenty per cent of estates use artificial manure.
2. Artificial manure is usually used, with the exception of a few estates with special facilities. Only small acreages can be manured with bulky manure.
3. Nearly all the manure is mixed;—one-third of Bones to two-thirds of Castor, is the usual proportion.
4. So far no harm appears to have been done to the tea, but a great deal of soil must be washed away by manuring steep slopes.
5. Manured tea gives 150 to 200 lb per acre more than unmanured.—M.

No. XXXVII.

Jan. 8.

Dear Sir,—In reply to your questions *re* manure:—

1. I cannot say whether manuring has become general in all districts or even in this district, but it is being done here.
2. Where bulky manure can be had it is applied and preferred for its lasting qualities, but more is being done with artificial, mostly white Castor and Bone Meal.
3. Manure is generally mixed in the Colombo mills before being sent off, (unfortunately we have not yet a railway to bring it); it mostly consists of Castor and Bones in the ratio of three to one.
4. Far from thinking harm is being done, I am confident much good is being done by manuring tea. I began at first with fear and trembling; but now I am a staunch advocate of manure, as it increases the yield, and gives a more healthy appearance to the bush, but I think the quality suffers somewhat. The only really serious charge lying at the door of artificial manure, is the contamination of the water supply, hence the greater prevalence of typhoid fever "*et hoc genus omne.*"
5. Compares favourably in every way, only manure when once begun must be continued at least every three years, or the bushes will go back, as the artificial stimulant must be kept up.

KELANI VALLEY.

No. XXXVIII.

OLD, AND MEDIUM ELEVATION, DISTRICT.

1. Manuring in this district is very general and appears to be carried on to a large extent on estates at a medium elevation and where transport is easy. It is by no means general in all the planting districts, at very high elevations scarcely any artificial manure is applied; and on estates to which transport is far and difficult, but little is carried out.
2. Bulk manure is applied whenever procurable, but on many estates there is little or no bulk manure worth speaking of.
3. When systematic manuring is carried on a mixture of Castor-cake and Bone-meal appears to be most generally applied, though fish manure and nitrates are also used, but not to so large an extent. In some instances fish manure is mixed with Castor-cake and Bone-meal.
4. I do not think that harm is being done to tea by the application of artificial manures; on the contrary I think the bushes are strengthened thereby, though I think when artificial manuring is started it must be continued or the bushes would cease to yield profitable flushes.
5. Old manured fields compare very favorably with unmanured fields of the same age, the bushes being larger and much more healthy in appearance, and the fields present a much finer cover. I might mention however two drawbacks to manuring, viz., the additional cost of weeding, and the loss of soil by wash, caused by the constant cutting of holes; this of course refers chiefly to wet districts and to steep land.

ÆQUUS IN ARDUIS.

No. XXXIX.

Matale, Jan. 9.

Dear Sir,—In reply to your favor, I only manured 22 acres with bulk, last year, and this year I have manured with Castor-cake and Bones 45 acres. I therefore really have not the necessary experience to give an opinion. There is very little manuring of tea in West Matale. I cannot speak of other districts, and I have not heard of any one in Matale West using artificial manures except myself. The little manure used in Matale is nearly all bulk, I believe. I cannot say, that the artificial manure, I have used this year, has reduced the price of my tea, and it has certainly increased my yield. The 45 acre field manured with Castor-cake and Bones has given 1,050lb. per acre, and the 22 acres manured with bulk last year has given 950lb. per acre.

The Bones and Castor-cake I got were mixed in Colombo. The bulk manure used was bought from natives, and was not anything like equal to manure made on the estate. MANAGER.

No. XL.

Wattegama, Jan. 9.

1. Not general yet, though some estates have adopted it with marked benefit.
2. No—too costly except near towns and villages and where lay of land permits of easy cart transport.
3. Mixtures vary; but Castor-cake, Bones and Sulphate of Ammonia and Nitrate of Potash are favorites, and fish is largely used, and kekuna near villages.
4. Less chance of harm would exist here; artificial manures always mixed with bulk. It

is most important to mix well with plenty of soil.

5. No comparison in old coffee land, yield doubled and more. T. KOKO.

P.S.—Beware of the practice of burying prunings. No tree feeds on its own refuse, or the result would be as in animal life? (by analogy, and probably experience will prove the truth later on if men are not careful.) *Absit omen*! Vegetable typhoid in tea would be a fell follower of *Hemileia vastatrix* in coffee.

No. XLI.

DEAR SIR,—Replying to your inquiries *re* manuring tea, I am sorry I cannot tell you much about it as very little has been done in that line as yet in the district; but there can I think be very little doubt about the beneficial effects from the manure already applied. In my opinion manuring is in many cases delayed too long on lowcountry estates and artificial manures do not seem to have much or any effect on *its worn-out soils*. A stitch in time would save nine.—Yours truly, L. A. W.

No. XLII.

Kandy, Jan. 14.

DEAR SIR,—The manuring of estates in this District is being tackled as the state of labour will permit. As far as one can judge moving about the country, older districts are getting more attention than new. Labour is more plentiful in the older districts than new.

II. Bulk manure unfortunately is a too scarce and expensive luxury.

III. Castor, Fish, Bones, with a small pinch of Nitrates added, are the manures most in vogue. Not so much Nitrates added last year owing to unfavourable exchange.

IV. In older districts, on our side Tea will derive benefit from manure of any kind. Bulk and artificial or either applied singly.

V. Where manuring has been carried out systematically over a term of years on the Kandy side, manured tea takes the upper seat. Manured tea will easily show returns of 550—600 as against 300—350 on unmanured fields.

In a forcing climate, it would be risky to say if Tea of a very high jât will give the results that an ordinary hybrid jât will, after an application of artificial manure.—Yours faithfully,

A NORTHERN PLANTER.

No. XLIII.

Udapussellawa, Jan. 11.

DEAR SIR,—I have done no manuring yet with *Artificial* manure to our tea; but my neighbours have and are doing a good deal and I am much interested in watching the results. A controversy will be most interesting if we can get the opinions of men who have watched the results of, say, 4 years. From what I *hear* the quantity is largely increased *without* sacrificing quality; but after the deadly effect that artificial manures had on our coffee, particularly salts of sorts, I should like to know more about its effects on tea before applying it to a large acreage.

Tea made off say 9-year old bushes never manured should be compared with tea made off bushes of the same age that have been manured say twice during the last four years. The yield will be recorded in the books. QUERIST.

No. XLIV.

Jan. 11.

SIR,—In reply to your circular *re* manuring of tea,—

I have very little experience, as I very seldom have time to travel about; but from what I know and hear, I should say that very few estates in what may be called the new districts or very few estates anywhere would use manure of any kind so long as the trees were of vigorous growth and tea yield satisfactory. If any manure were used, nothing but cattle would be applied in such case. On the contrary on old worn-out land in the old districts manure both cattle and artificial has no doubt been of great benefit in increasing the yield and in building up the framework of the trees. When the land is not worn out and tea is yielding well, I think manure of any kind is a mistake. In old districts and on worn-out estates the result of manures both cattle and artificial has been most marked both in growth of the trees and increased return of leaf, but I think the leaf is produced so much more rapidly that the tea is inferior to that obtained from unmanured fields. Good fields on good soil on the place that I am in charge of I have not manured, nor would I think of manuring, unless there was a most pronounced falling-off in the yield.

Those people who have good yielding estates and apply artificial manures will, I believe, kill "the goose that lays the golden eggs." I cannot see however that it is possible for any harm to be done by the use of cattle manure.

Those people who have estates planted on worn-out land can no doubt by artificial manure very largely increase the yield: in fact in many cases double it, but whether artificial manure can be applied beneficially for a long series of years is a problem that has yet to be solved.

I am sorry I have not answered under the different headings: but it is most difficult to do so and write anything but pure generalities.—Yours faithfully W. J. G.

No. XLV.

Matale, Jan. 20.

Re manuring tea, about 30 to 50 acres have been manured with cattle manure on this estate every year for the last six years with very good results. No patent manure has been tried as yet.

Z.

No. XLVI.

Jan. 14.

DEAR SIR,—I am afraid I am rather late in replying to your queries *re*-manuring of tea.

(1). I do not think the manuring of tea has yet become general in any District, though it is likely to become more of a necessity in the near future especially in the older Districts.

(2). Only a comparatively small number of Estates have facilities for obtaining and applying bulky manure in any quantity. It is decidedly preferable to artificial manure, and gives very satisfactory results where it can be regularly and cheaply procured, an application of about 24 tons* per acre being sufficient for three years at least.

(3). I am not in a position to give an opinion.

(4). I have not heard of harm being done in any case by the use of artificial manure. Of course, such manuring would have to be kept up,

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* *Sic* in copy; but our correspondent means surely "cwt."?—ED. *T.A.*

and there are cases of Tea Estates where very fine crops have been regularly got by the systematic use of artificial manure.

(5). I have not had any opportunity of making a comparison; I have only seen the wonderful improvement in tea and its yield on old and poor soil after the application of bulky manure.—Yours faithfully, I.

No. XLVII.

Badulla, Jan. 1.

DEAR SIR,—I have little or no knowledge of what is being done in the way of manuring tea outside this district. So far, a very limited area has been treated in this neighbourhood and that has been chiefly with bulky manure.—The results of a fairly liberal application of well-rotted bulk—cattleshed and street refuse chiefly—have been most satisfactory as regards increased yield, but whether quality has in any way suffered I cannot say.

Repeated doses of artificial manures, such as Nitrates or Bone Dust might show good results for a time, but I fear a sudden cessation of these doses would leave the bush in a worse condition than they found it. There can be little doubt, however, that a liberal application of suitable bulk brings the bush into a healthy and vigorous condition, largely increasing the yield and presumably—until the contrary is proved—not interfering with the quality. The cost of such manuring is, however, high and for this reason it is not likely to become very general.—Yours faithfully,

"OUVAH."

No. XLVIII.

DEAR SIR,—I send you the following replies to the queries in your circular of 26th ult. :—

No. 1 My experience is very local—(Kotagala Valley). A little manuring is being done on some estates.

(2) Bulky manure is no doubt always used, where procurable, but the supply must be very limited.

(3) Bone-dust, Castor-Cake and Nitrates, &c., are mostly applied alone—well-mixed with the soil.

(4) None—that I know of—altho' it may be prudent to guard against loss of "flavour" by the indiscriminate use of artificial manures, —or by too large doses at one time.

It is a fact that many plants lose their natural scents or oils—by manuring or cultivation. Take the wild carrot or celery, for instance. These are nauseous, naturally—but become edible when cultivated.

In my experience—the tea made after manuring with our ordinary manure—has lost some of its "pungency"—while it has gained in "body" and "maltiness." The yield is increased at least one-third.

For tea, our soils, as a rule, are too deficient in potash, and this is difficult to remedy by manuring, the salts being so very soluble, that much loss may be sustained—by their getting too deep in the soil—ere the plant can assimilate them.

(5) The oldest manured tea is *twice* as good in appearance—as the unmanured of the same age.

Without manuring (where required) tea will hardly pay—in future.

Analysis of the soil and of the manure to suit it, is indispensable. Or one may "be carrying coals to Newcastle."—Yours faithfully,

"SENEX."

No. XLIX.

Southern Province, Jan. 14.

DEAR SIR,—In reply to your favor of 8th idem, my experience of manure is as follows :—

1st As I have not worked tea estates in the old Districts, I can only write of the new.

2nd. No artificial.

3rd. I use 2 oz. Castor and 1 oz. Bone-dust to each bush well mixed with the soil.

4th On the contrary; but it must be kept up.

5th Unmanured tea compares unfavourably both in wood and leaf with manured.

Referring you to statement below.

	100 acres gave in	1894, 190 lb.	
Manured in March 1895	,,	1895, 272 ,,	gain 82 lb.
Not manured in March 1896	,,	1896, 420 ,,	230 ,,
	Increase over 1894		312 ,,

I am, yours faithfully,
B.

No. L.

Udapussellawa, Jan. 8.

DEAR SIR,—The following are my replies to your questions about manuring tea :—

1. A few estates in this district have applied manure, but as yet it has not become general.
2. Bulky manure is being used where it is obtainable at a reasonable cost; but on most estates the conditions are unfavourable for the keep of live stock. There is, however, little doubt that cattle manure is the best, as it gives good returns and does not force the bushes to such an extent as artificial manures do. The effects last a fairly long time, and regular flushes are secured; but the difficulty, in most cases, is to produce and apply it at a paying figure.
3. The manures principally used are Castor-cake, Fish, Crushed Bones, and Bonemeal. Sulphates and Nitrates are to be given a trial on a few properties, but they are to be mixed with Castorcake and Bones, and in some instances the prunings will be buried at the same time. In my opinion when these manures are applied every effort should be made to bury all prunings and dead leaves obtainable, as I think they materially help to carry on the bush after the artificial manures are exhausted, especially in thin, gravelly soils, and in a comparatively dry climate.
4. On this side of the country I do not think any harm has been done by manuring yet, but this may happen in time if large doses of artificial manures have to be resorted to. The question which presents itself to me at present is,—Will the bushes continue to give satisfactory yields without increasing the quantity at each application? If they will, my opinion is that little or no harm will be done (but the reverse); if they will not, then larger and larger applications will become the order of the day until the cost becomes prohibitive. This may be a danger looming ahead of us, as if manuring is suddenly stopped the bushes which have become accustomed to it will doubtless suffer considerably.
5. As far as we have got in this district (the lower and older end of it) there can be little doubt that in most cases the manure, whether bulky or artificial, has worked wonders upon the frames of the bushes, and also has given a fair profit, but as it is only within the last few years

that manuring has been started here, it will take sometime yet to form a correct opinion of what it may or may not do in the future.—Yours truly,

G. T. R.

No. LI.

Kelani Valley, Jan. 20.

DEAR SIR,—Replying to your circular letter of the 26th ultimo:—

1. Manuring is decidedly on the increase in both old and new districts.

2. Very little bulky manure is used as coolies cannot be spared to look after cattle or to carry out the manure to the field.

3. The principal manures used by estates are Castorcake, Bonedust and Fish manure.

4. In my opinion both the bushes and crops are distinctly improved by the use of artificial manure.

5. Favourably in every way. I believe that manuring would be done on a much larger scale than it is at present, but for the insufficient supply of labour.—Yours faithfully.

J. B. C.

No. LII.

St. Leonards, Nuwara Eliya, Jan 22.

DEAR SIR,—In reply to your circular *re* manure:—

1. Local experience is that very little manuring is done.

2. On this estate *only* cattle manure has been applied; no artificial.

3. On neighbouring estates some Cake, Bones and Nitrates are being applied.

4. Undue use of *any* stimulants in any form *must* in time prove noxious.

5. Where soil is good the effects of manure are not noticeable: old worn-out spots are much improved by cattle manure, also by a judicious mixture of Cake and Bones In this district—the upper end all land is comparatively *new* and does not require manure.

You will be doing a public benefit by inveighing all you can against *undue* applications of artificial manures. Planters have money now and are not averse to liberal (?) cultivation. In a short time we cannot expect the same profits. Starvation cultivation will then be resorted to, and tea will be much in the same position as coffee was.—I am, Dear Sir, Yours faithfully,

C. H. B.

No. LIII.

Talawakele, Jan. 24.

Every acre now in cultivation could by manuring be made to yield from 200 lb. to 300 lb. (on all fine soils even more) per acre additional and the area under the bush could be doubled. Conceive then what Ceylon output might be! Double the labour force now in Ceylon and in 15 years you would ship 2½ times what we are doing.

The question of manuring is one there need be no hesitation in facing, having regard to the fact that life is short.

Unquestionably if you cut holes or dig about a bush for the purpose of manuring you must cut a certain period off its natural life as you cannot help breaking or cutting the large roots; in fact any artificial method of forcing leaf or fruit must in the nature of it interfere with the natural period of its life whatever that may be.

My view of it is: if you cultivate your bush you will take out of it, in possibly 30 or 40 years, what it will give if not forced in 55 or 60. Few people would object to that, if there is anything in a bird in the hand being worth two in the bush.

Of course, care must be exercised in selection of fertilizers and the sooner an Ordinance is passed the better, to protect planters from spurious manures.

I see infinite harm being done in manuring where care is not taken in cutting roots, as they never grow again—I mean the large roots.

Then as to the question of manuring doing injury to the quality of the Tea you may just as well say that rich soil produces an inferior Tea to poor soil!!

S.

No. LIV.

Talawakele, Jan. 1.

Manuring of tea is yet in its infancy and we are all more or less groping in the dark—so far we know that certain fertilizers produce certain results in the way of increased flush and that is about all.

What is wanted is a full knowledge of such manures as are available, and what their effects are in not alone increasing flush, but in *improving* or *otherwise* the quality of teas.

To find out this, systematic and carefully conducted experiments on a large scale are necessary and it is to be hoped that some of our wealthy proprietary planters will take the matter up.

T. F.

No. LV.

Ramboda, Jan. 20.

DEAR SIR,—In reply to your enquiry on the subject of manuring tea. There seems to be an inclination to put out bulky manure, if procurable in preference to artificial.

However the expense of a cattle establishment and the occupation of so much good land for cultivation in grass is a preventive to any extensive or general application of bulky manure.

I believe most of the V. A.'s are advocating the use of artificial manures in old tea.—Yours faithfully.

H.

No. LVI.

Jan. 25.

In older districts, where tea has supplanted coffee, Castorcake and Bonedust have been applied with advantage, and the returns increased. Cattle bulk and compost also, but the latter manures have in many instances proved much too expensive on the extra returns. Unless facilities are exceptionally good, artificial manures are more satisfactory.

Personally, I think the less tonics applied where tea is giving a fair yield, the better for the bushes, although in worn-out soil something must be done to encourage flushes. I question very much if a really serious interest has been taken in having the soils analyzed to enable those who manure to return what is wanting.

A perusal of Mr. Kelway-Bamber's Text Book on the Chemistry and Agriculture of Tea would be of valuable assistance to those manuring. Copies can be obtained from the *Observer Office*.—I am, Yours.

R. W.

No. LVII.

East Haputale, Jan. 29.

My experience of Manuring Tea is so very slight that it is not worth while publishing. I only manured one field with Bones and Castor-

cake—one of the former to three of the latter—in Sept. 1894. Results have been most satisfactory; the field was pruned in July last, the results since pruning have been more apparent than before. It is flushing now like fun, and giving 20 to 30 lb. leaf per cooly every eight days. Unmanured fields no way near it.

Manuring with bulk, I have only done a few acres with line refuse, &c., near cooly lines. Results are highly satisfactory, but unless your land is fairly level and soil sufficiently free to admit of forking in the manure, the expense of applying bulky manure would be prohibitory. Imagine cost of cutting and filling in 3,600 holes to an acre and if you give ½ a basket to a tree with any distance to carry. On fairly flat land free soil that could be forked, application might be brought within reasonable limits. How much of this land is there in Uva? PLANTER.

No. LVIII.

Kotagala, Feb. 3.

DEAR SIR,—So far as I have observed, manuring is pretty general on tea estates but not very extensive. I mean that most estates manure a little, both in old and new districts.

2. Bulky manure is not available in large quantities with a few exceptions,—and application is necessarily expensive unless for fields near a cart road.

3. The manure sent up by railway is generally used alone, sometimes mixed with prunings and with bulk when available such as Line and Factory sweepings, Bazaar refuse, etc. Bonemeal and Castorcake appear to be most generally used, with occasionally Nitrate of Potash in small quantities, and there is also an appreciable quantity of Fish manure used. I have no experience of the latter, but would fear its use would encourage blossom and seed on the bushes.

4. I do not think any harm is being done to the bushes from the use of artificial manure—rather the opposite. On poor land an application of manure even to comparatively young tea is beneficial as it improves the wood and expands the bushes. On very rich soil artificial manure appears to give the tea a rankness which I do not think improves the quality. In fact on rich land I think it is a mistake to manure, as it makes the flushes too fibrous and coarse.

5. Unless overdone manured tea compares fafourably with unmanured especially on poor old land.

To enable planters to give necessary manurial assistance to land requiring such, Government ought to give all possible assistance in providing cart roads to stations as otherwise transport is prohibitive.—Yours faithfully, W. H. W.

No. LIX.

Ambagamuwa, Feb. 12.

DEAR SIR,—Now that you are about to close your columns to the "Manuring" discussion, if you think it worth publishing my experience in that line I now submit it. Since 1890 I have manured this estate both with artificial and bulk; the former comprised of either fish, kapok, and blood manure mixed 6 ounces to the tree, or castorcake and bones mixed—same quantity applied. This was resorted to only on inaccessible fields, I always found that in 3 months the manure had begun to act and its effects were appreciably noticed up to say from 15 to 16 months after application, the bushes responded in a marked manner, the yield was ⅓ more than it was before application, but after the run of 16 months I always noticed a falling-off; and at about the end of two years you were no better than when you started, if anything worse; the bushes presented an all-gone seedy appearance suggesting as it were "I want a stimulant to fig me up," a second application of a like quantity (6) ounces did not by any chance result in the same way as at first although it did some good. I am therefore of opinion that if artificial manure is to be applied it will become necessary to increase the dose at every subsequent manuring; just likens one to an opium-eater; first a minute quantity hardly perceptible, till in after years ½ an ounce would be about the sufficing quantity to allay his craving. Will artificial manure pay in the end?!

Bulk.—Situated as Iam and being possessed of grazingland I keep a stock of native cattle which yearly gives me enough manure for from 40 to 50 acres; a basket of cattle manure to 4 trees; this application takes longer to tell; but once it does, the bushes present such a luxuriant growth with a strong healthy dark green appearance which makes the heart of man glad to look at; its effects will last out a good 2½ to 3 years, and a second application will only require to be made after that time, the quantity being far less than on the first application. Say a basket to 6 trees, your bushes never present that unhealthy woebegone look which is noticeable after the effects of artificial manure have ceased to tell, so that there can be no two doubts that the stability of tea will in a great manner depend on the kind of manure you apply; the yielding powers from bulk manure may not be quite so much as from forcing artificial, but the fact remains that there it is in paying quantity and will remain so long as you last. C. T.

No. LX.

Feb. 15.

DEAR SIR,—I have not been asked for my *obiter dicta* regarding manuring and yet intended writing you before now, since it seems to me I have more data on the subject than anybody else this end of tea-land. The season 1895-1896 saw the completion of a systematic cycle of cultivation and the estimate realized nearly 100 per cent increase on the 1894-1895 crop. Experimental handling of artificial manures has given Castorcake and Crushed Bones the laurels, and a schedule should show manuring to be no outlay of capital for the crop doubled—your tea is cheaper f.o.b. Colombo. Here are a few blocks as examples:—

1 Fields, all old coffee land of say 35 years	21 Acres	35 Acres	41 Acres	27 Acres	43 Acres
2 1894-1895 yield per acre	204 lb.	304 lb.	143 lb.	186 lb.	305 lb
3 Manured	Dc.'95	Mr.'95	Jn.'96	Nv.'96	Dc.'95
4 1895-1896 yield per acre	425 lb.	726 lb.	310 lb.	317 lb.	637 lb.

There are so many factors to be remembered in cultivation that space forbids enumeration. Pruning and character of tea to be treated, rainfall dates and nature of soil, being the chief. Then has to be considered method of application, for loss of soil cannot be permitted and is easily obviated on steeps. The mamoty is a sorry cultivator compared to the fork; but don't spread manure broadcast, get it into the ground with an alavangu followed by forking, treading down the new earth exposed. You would not ask me "why," for the primary question is what is the crop—fruit or leaf! Manuring is demanded by

the crop every third year. Experience bids me say that Sulphate of Ammonia is playing with fire unless one knows what he is handling and Bamber's "Chemistry and Agriculture of Tea" gives an emphatic warning should one be elated by such monstrosities as twin stalks and triple "bangce" l aves after applying Sulphate of Ammonia, however mixed with wood ash, bones or fish or etcetera.—Yours truly,

HOMO PLANTAT, HOMO IRRIGAT, SED DEUS DAT INCREMENTUM.

No. LXI.

DIMBULA.—I thoroughly believe in manuring, but we should have more coolies or manuring is of no use; on old fields the first application of manure does not result in much more leaf, but the trees fill out and strengthen the wood on them, and the following year you get the benefit. I have manured for over 6 years a portion of the estate each year with Castorcake and Bones, only one part of the latter to 5 of the former—cattle manure does not tell for many months after the application, but it lasts double the time of artificial and does not leave any bad effects afterwards as artificial sometimes does.—J.J.

[This closes the series of letters kindly sent to us on the Manuring of Tea: the whole are being reproduced in our *Tropical Agriculturist* with our several reviews; and afterwards some copies will be printed in pamphlet form for ready reference: one copy of which will be sent with our compliments and thanks to each contributor to the series.—ED. *T.A*]

THE AGRAOUVAH ESTATES COMPANY, LTD.

The annual ordinary general meeting of shareholders of the above Company was held at the Company's Offices, No. 7, Queen Street, Fort, Colombo, at 3·30 p.m. on Feb. 11th.

Present:—Mr. A. Thomson, Chairman; Mr. C. A. Leechman, Director; Messrs. A. Stevenson, H. Tarrant, Jas. Forbes, Geo, Noel, and C. J. Donald. The following shareholders were represented by the holders of their Powers of Attorney:—Mr. Wm. Watson, by Mr. J. G. Wardrop; Mr. E. John. by Mr. R. John; Mr. G. C. Walker, by Mr. Jas. Forbes; Mr. G. H. Alston, by Mr. A. Thomson: Mr. W. H. Figg, by Mr. Thomson.

The report and accounts of the Company as published were adopted, and a final dividend of 14 per cent (making 22 per cent for the year), was declared and made payable forthwith.

Mr. C. A. Leechman was re-elected a Director, and Mr. Hercules J. Scott, was appointed Auditor for this year.

A vote of thanks to the chair closed the proceedings.

The following is the report:—

Acreage, 31st December 1896.

Agra Onvah.		
Tea in full bearing	..	302 acres
Tea not in bearing	..	20 ,,
Grass in Jungle	..	9 ,,
Total Estate	..	331 acres
Fankerton.		
Tea in full bearing	..	165 acres
Timber clearing	..	10 ,,
Grass, Patana and Scrub	..	18 ,,
Total Estate	..	193 acres
Grand Total	..	524 acres

The directors have pleasure in presenting to the shareholders the accounts of the Company for the past year.

The crops secured were 257,004 lb. tea, as against 191.685 lb. in 1895, and 487 bushels coffee, as against 1,291 bushels in 1895.

The average net prices obtained were 61·29 cents per lb. for the tea crop and R16·64 per bushel for the coffee crop, against about 66¼ cents per lb. and R17·85 per bushel respectively in 1895. The receipts for manufacturing tea for other estates shew an increase of R6,856·43 as compared with the figures for the preceding year.

The expenditure on capital account during the year amounted to R17,798·50, this outlay being for additions to buildings and machinery and on a new clearing of 20 acres tea on Agra Onvah.

After making the usual ample provision for depreciation of Buildings and Machinery, and including the balance of R6,439·10 brought forward from 1895, the amount at credit of Profit and Loss account is R94,301·82, being rather over 25 per cent on the paid up Capital of the Company. An interim dividend of 8 per cent was declared on the 8th August last, absorbing R30,000, thus leaving a balance of R64,381·82 now to be dealt with.

The Directors recommend the payment of a final dividend of 14 per cent, making 22 per cent for the year, and that the balance of R11,881·82 be carried forward to the current year's account.

The crops estimated for in 1897 are 265,000 lb. Tea and 100 bushels Coffee, on an expenditure on the Estate of R79,557·50, which outlay is inclusive of the cost of manufacture of 135,000 lb. Tea expected from other Estates for that purpose, and the upkeep of the 20 acres clearing planted last year. No expenditure on Capital account is expected to be necessary this year.

At Extraordinary General Meetings held on 24th October and 14th November, 1896, special resolutions were passed increasing the Authorized Capital of the Company to R750,000, thus placing the Directors in a position to add to add to the properties of the Company on any favorable opportunity for so doing presenting itself.

Messrs. G. W. Carlyon and W. H. Figg having resigned their seats on the Board on their departure respectively from the Island, Messrs. A. Thomson and G. H. Alston were appointed by the remaining Directors to fill the vacancies thus created. In terms of the Articles of Association Mr. C. A. Leechman retires by rotation from the office of Director, but is eligible for re-election. On 8th January of this year Mr. Alexander Stevenson resigned his appointment as Director, but in the opinion of the Board it is unnecessary to fill up this vacancy.

Mr. R. L. M. Brown having resigned the post of Auditor to the Company, the Directors, under the Company's Article No. 92, appointed Mr. Hercules J. Scott to fill the vacancy, thus occasioned. The appointment of an Auditor for the current year rests with the meeting.

CHINA'S AWAKENING.

A CEYLON TEA PROPRIETOR ON CHINA TEA.

Mr. T. Fairhurst, who is well known in Ceylon as the owner of Ferham and St. Andrew's estates, Dimbula, but who spends his time mostly at Foochow, is at present on a visit to the island. Speaking to the representative of a contemporary he said:—"Well, I suppose the point of most interest is the introduction of machinery for tea manufacture into China, but I am afraid that, so far, I can tell you but very little. You see, things are very different in China from what they are, here. Here you get tea all the year round; but in China they only get it in crops—three crops in a year—and of those the finest and best crop is the first one, which is gathered in April. That is always equal to about half or a little more than half—of the total crop from the Foochow district in a year, and, as far as the use of machinery will affect the teas, we had little opportunity of judging in 1896, for, when the machinery that is now there was erected, the first

crop had been gathered, and the machinery could therefore only be used for the later crops, which are much inferior and do not afford a proper test."

"The machinery then was used for the second and third crops?"

"Yes, and it had a noticeable effect on the tea, as far as appearance and the strength of the liquor went but it made no alteration whatever in regard to the flavour of the tea—not the slightest improvement being noticeable. Asked what increase in the cost of manufacture was brought about by the use of machinery in regard to the teas on which it had so far been tried, Mr. Fairhurst said; "Well they reckon it means an additional outlay of about 1¼d, and whether that will be made up by a longer price being got for the tea in England and in the other markets, I cannot yet tell you, for the total quantity of machine-manufactured tea sent home last year was not more than 1,500 or 1,600 packages, and that, of course, was largely bought as a curiosity, being competed for in an exceptional manner on account of its novelty, and so affording no guide. Everything is to be learned this year, and all depends on the first crop. If it answers in regard to that, then machinery will be adopted on a larger scale, and it may be that then China will once again be a rival with Ceylon and India in regard to the better classes of tea. As far as the Foochow district is concerned we shall learn the first results of machinery manufacture in May, and we shall know the financial result of the experiment in July when we learn what the teas fetch. But the experiment will not be a very large one, there will be only ready for use some five rollers and about three dryers; but in addition there are men who intend going on rolling the leaf by the old manual process, but who have consented to try indoor withering instead of sun withering and to use Ceylon methods of fermenting. They seem to have realised that indoor withering is preferable to the other system, and they are now putting up the necessary buildings for doing this work; but, taking all these improvements in manufacture, they will not affect more than a tenth of our output in Foochow —say about 40.000 half-chests." Foochow, according to Mr. Fairhurst, is the pioneer district in China as far as this movement is concerned. He passed through Amoy on his way here, and he assured us that we had been wrongly informed in respect to that district when we were told that machinery had been already introduced there. So far nothing has been done there beyond talk, and they are evidently going to wait and see the outcome of the Foochow experiment. In the latter district the movement has been entirely the result of the introduction of European capital, with the result that the Europeans who have found the money have persuaded the Chinese, who have to take up the lands (no European being allowed to take lands) to adopt the new methods. The principal movers in this respect have been the Foochow Tea Improvement Company, which, he says, consists of about 6 Europeans and 6 Chinese, each of whom have put one thousand dollars into the concern.

The new methods are only to be applied to the higher grades of tea. In one respect, according to Mr. Fairhurst, the position of Foochow is unassailable, that is, in regard to its power of producing cheap common teas. These it can turn out at a price of 4½d to 5d, and in this respect it leads other tea-producing countries easily.

Asked if the water supply was good, Mr. Fairhurst said: "Far from it; there are a lot of streams all about the district, but the force of any of them is scarcely more than sufficient to drive a 16 feet wheel, which amount of power is just about what one Excelsior roller only requires. Steam will have to be largely restored to, therefore, and in producing this the Chinese have at present no coal of their own to help them;—the cheapest available coal is that which they can get from Japan. Another difficulty arises from the short space of time they have in which to gather and manufacture the first and most important crop. It will all have to be dealt with in the short space of six weeks, think of the vast amount of machinery they will have to get to do that."

NO CHANGE OF JAT LIKELY TO SUCCEED.

Asked if he thought it likely the Chinamen would go in for new *jats* of tea in connection with this progressive movement, Mr. Fairhurst said he did not think any innovation of this sort would be likely to prosper. "The Tea Improvement Company," he said, "are getting down some Indian teas; but I do not think from my experience of Formosa teas they will succeed. Formosa teas, you know, were originally Chinas. They were taken from China, and planted in Formosa where they did amazingly well in the volcanic soil that Formosa possesses. Some time ago I tried the experiment of bringing some of the Formosa teas here, and planting them on my places in Dimbu'a, but there they went back to the old China state, showing it was the Formosa soil alone that improved them. The same thing will happen, I think, with these Indian importations; they will very quickly become like the Chinese indigenous teas, and the idea of using them will be abandoned."

CEYLON V. JAVA AS TEA PRODUCERS.

(*By an ex-Merchant-Planter.*)

London, Jan. 22.

I thought my letter of the 15th inst. would be the last I should have to trouble you with, on the subject referred to in my three previous ones; but as you transmuted the word "Java" into "Japan," when publishing my letter of the 10th ult., it is necessary to draw your attention to the mistake.

I wrote the word *Java*, and not Japan purposely, because the latter is not, and I think never will be, a competitor with Ceylon in the supply of tea to the European markets*; whereas Java will most probably in time become a serious rival, especially if it continues to be supported, and encouraged by British protection, as it is at present.

I do not know that Java has not as good a climate for the production of tea as Ceylon; but I do know that it has a much better soil, a large area of available land, and a good supply of labour.

It is true, the import of Java tea into England last year was only seven million of pounds, and that the increase year by year has been comparatively small; but remember the cinchona incident, in which the tortoise beat the hare. It will not be wise for Ceylon planters to take a leaf out of the Indian planter's book, and pooh-pooh the idea of Java (where the tea is similar to that of Ceylon and made on the same lines) ever becoming a serious adversary.

We all of us recollect how Indian planters jeered at the idea of tea in Ceylon ever becoming a permanent and increasing industry. Nay, even now—according to "W. McK."—they say to Ceylon men:—"Oh! Ceylon may supply the Colonies, America, and the Continent, but we will soon have the English market all to ourselves, and will be content with it." Let us not be too confident. In the battle which is undoubtedly before us, we cannot afford to be generous. Planters may say:—"Oh! we can do very well with exchange at 1s 3d or 1s 4d"; but that you know is not the question. It is, "Can we afford to present our adversaries with 10 to 15 per cent. of the value, to enable them to compete with us?" Is there any call to give them any advantage at all?

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* But Japan is a great rival in the United States —ED. *T.A.*

There is a danger, that if the rates of exchange decline a little as they well may, planters will think the storm cones may be lowered, as the storm is passing away; if they think it cannot return, they will find themselves mistaken and may be wrecked before they reach a harbour. Let them remember it has taken years for the wail of the Sugar planters to reach the ears of Government, and when it has reached them they are soothed with a Grand Committee to find out what is patent to the whole world, namely, that they have been ruined by bounties on the production for export of Beet Sugar.

The mischief I have written to you about, is an insidious one, but on that account is not less real. If exchange on the present system goes back to 1s 2d, as it may some months hence, it will still exist.

Ceylon should endeavour to free itself financially from a Government which for its own purposes will "corner" its currency, as it did when it ceased to mint silver for the public.

I sent my letter to the Secretary of State to Mr. W. E. Thompson Sharpe as being the member for Ceylon and asked him to be good enough to forward it direct to Mr. Chamberlain. I have not yet had an acknowledgment of its receipt.

[About Java is our correspondent not aware that the standard is a gold one there, or at any rate that it is based on gold, although the actual currency is silver, the coins being merely tokens as in England. We think, therefore, that Java tea planters can have no advantage over us through Exchange?—ED *T.A.*]

By today's mail, we have received the following:—

"Jan. 29.—I enclose copy of Mr. Chamberlain's reply to the letter I wrote to him of which I sent you a copy.

"It is the one I was led to believe I should receive, but as mentioned to you in my letter of the 1st inst., the grievance I asked you to be good enough to ventilate, did not exist when the inquiry took place. The Indian Rates of Exchange were regulated by the market prices of silver, and as long as that was the case, Ceylon had no cause of complaint."

———

(*Copy.*) Downing Street, Jan. 28.

C. SHAND, Esq.

SIR,—I am directed by Mr. Secretary Chamberlain to acknowledge receipt of your letter of the 4th inst., relative to the Tea rade of Ceylon, and the Currency system of that Colony.

Mr. Chamberlain has given your letter very careful consideration; but he is unable to see sufficient reason for reopening the question of the Ceylon Currency, which was most fully considered in all its bearings by the Silver Currency Commission, whose report was published in the Co ony in 1894.—I am, &c., JOHN BRAMSTON.

TEA CULTIVATION AND TROUBLESOME WEEDS—WORTH DIGGING IN?

[The following has been put at our service by a Colombo mercantile firm.—ED. *T.A.*]

February 6, 1897.

From Royal Botanic Gardens, Hakgala.

Dear Mr. ———,—The Oscatis that is such a troublesome weed is *O. Violacea.* It belongs to the Geranium family (Geraniaceæ) and therefore cannot be called a trefoil which belongs to the order Leguminosae, and generally applied to *Trifolium.*

The *Oscalis Violacea* is a native of United States.

(Signed) W. NOCK.

Copy. City Analyst's Office, Colombo, Dec. 3, 1896.

Report on a sample of so-called Trefoil leaves, received for analysis, on the 25th November 1896.

The sample of so-called trefoil plants consisted of ⅔rds by weight of stem and leaves, and ⅓rd roots. The leaves and stems of the so-called trefoil consisted of about 90 per cent moisture, and 10 per cent dry matter.

The roots consisted of about 60 per cent moisture and 40 per cent dry matter.

In 100 parts of the whole plant, there were 20 parts of dry matter, and 80 parts of moisture. The roots, thus, furnished 66·66 per cent of the dry matter, and the stems and leaves furnished 33·33 per cent.

The dry matter of the leaves and stems, and that of the roots, were analysed separately, with a view to ascertain the proportions of the important elements of plant food, taken from the soil by each.

ANALYSIS OF DRY MATTER.

	Stems and Leaves per cent.	Roots per cent.
Nitrogen ..	.. 2·794	.. 1·280
Potash ..	.. 2·679	.. ·871
Phosphoric Acid	.. ·691	.. ·417
Lime ..	.. 1·596	.. ·352

In order to compare the amount of these constituents removed from the soil by the so-called trefoil and by tea respectively, the following tabular statement will show the amounts of these substances contained in 1,000 lb. of tea, of Trefoil leaves and stems, of Trefoil roots, and of the whole Trefoil plant, all in the dry state.

Tabular statement showing the amounts of important constituents of plant food contained in 1,000 lb. respectively of tea, Trefoil leaves and stems, Trefoil roots, and this whole so-called Trefoil plant dried at 212° F.:—

	Tea. lb.	Trefoil Leaves and Stems. lb.	Trefoil Roots. lb.	Whole Trefoil Plant. lb.
Nitrogen ..	46·02	27·94	12·80	17·85
Potash ..	23·61	26·79	8·71	14·74
Phosphoric Acid	7·98	6·91	4 17	5·08
Lime ..	5 88	15.96	3·52	7·82

It will be observed that the so-called Trefoil plant contains, weight for weight of dry matter, about 28 parts to the 1,000 in its leaves and stems, as against 46 in the case of tea; but, as the former is a leguminous plant, a portion of this nitrogen must be assumed to be derived from the air, and would, therefore, be a distinct gain to the soil if dug in. The plant seems also to be rather greedy in the matter of Potash and Phosphoric Acid, which, from an agricultural point of view, are the two most important constituents, after Nitrogen, of the tea plant, and which are altogether derived from the soil or from manure. While the so-called Trefoli plant is growing, therefore, it competes with the tea plant, for these elements of plant food as it draws its supplies, however, from near the surface, the advantage to be derived from digging it into the soil as a green manure, might more than compensate for the preliminary abstraction of these elements from the soil, these being again returned in a more readily available state for use by the tea plant.

(Signed) M. COCHRAN, F.C.S., City Analyst.

SILK IN INDIA.—Silk is not likely, says the *Englishman*, to become one of the products of the North-West Provinces, unless great meteorological changes come about. Repeated attempts on the Cawnpore experimental farm to rear silk worms from Assam have proved a failure. The hot temperature is fatal to the worms, which die soon after being received.

Correspondence.

To the Editor.

AGRICULTURAL PROGRESS IN ZANZIBAR

Zanzibar, Jan. 11.

DEAR SIR,—The Government of Zanzibar have decided to appoint a Director of Agriculture and have selected me for the post.

The object in creating the post is to improve, where possible, the methods under which the agriculture of the country is now carried on, and to endeavour, by experiment, to discover some new product that may, to a certain extent, take the place of cloves. The Government desire that the work so admirably begun by Sir John Kirk when he was Consul-General there, and since interrupted, may be continued.

I have taken the liberty of addressing you * in the hope that you will consent to open communication with me, with the view of exchanging information that may be considered of value, and of mutual assistance in obtaining plants and seeds that may be required. It will afford me pleasure if, at any time, I can be of use to you, and I hope you will consider me at your service.

Zanzibar does not as yet issue a Botanical Journal; but, if in the course of time it becomes possible to do so, I shall be glad to send you copies, meanwhile if you will be good enough to supply me with any of your publications I shall be happy to reciprocate your kindness.—I am, dear sir, yours truly,

R. N. LYNE.

TUSSER CULTIVATION.

Weuda, Feb. 6.

DEAR SIR,—The appeal which I made some months ago in your columns for live Tusser cocoons met with no response, but I succeeded in finding some in another district and have got the moths to pair without much difficulty. The next step in their domestication is to get the worms to feed in confinement. It will be probably impossible to feed the worms of the first brood on single leaves, like the mulberry feeding worms but they can easily be reared on small branches of loquat, Kahata (patana oak), avocado pear or weralu, placed in bottles of water. They spin in about 30 days.

These worms will probably do better at higher elevations than this: I have grown very fine cocoons in Dimbula, being somewhat pressed for space, with the Japanese mulberry silkworms and other species, I shall be glad to distribute half of these eggs, gratis, in lots of 50, to any applicants who may care to assist in their domestication.—Yours faithfully, B.

MR. TURING MACKENZIE AND THE CLIMATE OF PERAK.

SIR,—I have just seen in the *Penang Gazette* of January 29th an extract from your paper† quoting an interview with Mr. Turing Mackenzie, who is reported to have stated, when referring to coffee planting in Perak and Singapore—"I would chuck up my Sumatra land tomorrow to take up land on the Government terms there, but the climate of Sumatra is very much better at all events than that of Perak—witness the churchyard at Thaiping, which speaks for itself. It is excellently well furnished, mostly with men under 35 years of age, malaria being the great scourge."

For Mr. W. Turing Mackenzie to have made a statement of this nature either shows that he must have a barely bowing acquaintance with the Perak climate or he has been very much misinformed. The Thaiping churchyard, which has been in existence for 20 years, has at present 38 graves (Europeans). The number includes five children and six women. I am in a position to state that malarial fever caused the death of two, possibly three of the total number, so that the statement about "fever" being the cause of the number of graves in the churchyard is erroneous.

It will be news to the several ex-Sumatra Planters now resident in Perak to learn of the superiority of the Sumatra climate as compared with ours. Speaking from an experience of nearly nine years in Perak, I am able to state that the type of malarial fever met with is comparatively mild, except when there is severe and prolonged exposure, as in the case of those engaged in the Trigonometrical Survey.

I shall, therefore, be much obliged if you will publish this letter to endeavour to do away with any misapprehension that may have been raised through Mr. W. Turing Mackenzie's somewhat rash statement.—I am, &c., S. C. G. FOX,

District-Surgeon, Perak.

Thaiping, Perak, February 4th.

MR. MACKENZIE'S REPLY.

Upcountry, Feb. 13.

SIR,—I take off my hat to Dr. Fox, who is a good specimen of the climate of Perak, and as he gives actual figures there is no more to be said.

For myself, I confess to the funks as regards Perak, and during the past year three of my particular friends have been at death's door from fever in Thaiping, two of whom had no connection with the Trigonometrical Survey.

"The climate of Sumatra" is a tall order; but speaking of my own district of Boven Serdang, it is certainly the best lowcountry climate that I know; and my experiences have been many and various.

W. TURING MACKENZIE.

THE COCONUT PALM AND THE SENSITIVE PLANT.

DEAR SIR,—Can any of your scientific readers explain what influence the sensitive plant (*Mimosa pudica*—Sinhalese (*Nidikumba*) has on the growth of the cocount tree (*Cocos nucifera*)? It is asserted that wherever this plant (or weed) grows at the foot of a coconut tree, that tree thrives better than others, and is a more prolific bearer. I heard this a few years ago, and recently when going over a large tract of coconuts at Welikada, I mentioned it to the proprietor and he told me that he was cognizant of the fact, and that he had noticed it on some of his trees: accordingly we visited the spot. I was impressed with what I saw—the trees growing there, taking them as a whole, were not very good specimens. Some looked "jaundiced," the result of hard, bare, cabook soil and quick evaporation of moisture; but those at the foot of which the sensitive plants were growing, certainly looked more robust and their superiority over the rest was at once perceptible. The following theories to my mind bear a certain amount of weight in the solution of the question, viz:—The weed being a surface feeder, it is probable that its roots open out the surface soil, thus making it easy for the coconut to absorb moisture; or it may be that the roots or tubers of the weed contain certain chemical properties favourable to the growth of the coconut, which the spongioles of its rootlets readily imbibe; or that the weed affords a certain amount of succour to the coconuts, by shading its roots from the scorching heat of the fierce rays of the sun.

I pointed out the absurdity of manuring coconuts with husks and dry fronds. No tree thrives on its own refuse; coconut husk takes years to decay and in its damp musty state, is a favourable receptacle for the larvæ of grub,

* As Editor of *Tropical Agriculturist.*
† Local "Times."

In the property known as "The Moss" at Maradana, which belonged to the late Mr. J. A. Martensz, it was discovered that husks buried at the foot of trees were in a fairly good state of preservation after a lapse of 20 years, and the trees had apparently derived no benefit from them. There was no mistake regarding the period as records showing the dates when each field or plot was "manured" were forthcoming.—Yours truly, C. A. C.

USEFUL PLANTS AGAINST MALARIA AND INSECT PESTS.

DEAR SIR,—"Householder" 's letter on page 573 is interesting. It is true we do not hear of much that is being done to encourage the cultivation of trees for the object of warding off malaria and insect pests. The trees that have of late years gained the highest repute from a sanitary point of view are most probably various species of *Eucalyptus*, especially the "Blue Gum" (*E. globulus*) and *E. amygdalina*. These are said to have exercised on regions congenial to their growth more hygienic influence than any other arboreus vegetation. They are natives chiefly of Australia and Tasmania and have been introduced into many parts of the world and planted largely in malarial districts, as in the Mediterranean region and parts of Italy, and to some extent at the higher elevations in this country. Species of cinchona also—apart from their yield of quinine, which undoubtedly is the most powerful febrifuge as yet known—are believed by some to have strong deodorant properties. Among the list of febrifugal or sanitary trees, the Ceylon cinnamon, which causes the proverbial spicy breezes of our island, should surely find a prominent place.

It cannot be doubted that the cultivation of some trees more than others, whether by the result of the action of their roots on the soil or by exhalation from the leaves or by both, play an important part in the purifying of the atmosphere in their neighbourhood. Yet one must not be too credulous in regard to plants that are said to afford protection from snakes and mosquitoes, and to be able to drive away rats, &c. Most of us will have heard of the Upas-tree (*Antiaria toxicaria*) of Java which used to be credited with having the power of putting an end to *any* animal life that came within several yards of the tree, on account of an enormous quantity of carbonic acid gas which it was said to be constantly giving off. A Dutch surgeon wrote about the end of the last century that "criminals condemned to death were given the option of going up the Upas-tree to collect the poison, but not more than two out of every twenty returned."

Vedaralas tell us with indisputable proofs that no cobra or polonga will venture within some considerable distance of the "Ankenda" (*Acromychia laurifolia*), whilst the possession of a small piece of the root of "Elawara" (*Calotropis gigantea*, var.) is said to be one of the best safeguards against snakebites. We ourselves are well enough used to seeing the "Boy" going over the rooms on an evening carrying a burning lump of the gum-resin of "Malkekuna" (*Canarium zeylanicum*) for the purpose of driving away unwelcome visitors. *Ocymum sanctum*, the Holy Basil of the Hindus, is acknowledged by many people to be a great enemy of the mosquito. Not less important, however, is the root "Vadakaha" (*Acorus calamus*) said to be: when freshly cut and retaining its full aroma, it is reported to drive away fleas and other insects. REX.

HOW TO RAISE RHEA PLANTS FROM SEED.

DEAR SIR,—Many enquiries have reached us from India, Straits, Sumatra, &c., as to the best way of treating Bœhmeria Nivea (Rhea) seed.

Our experience in raising plants from seed is as follows:—Prepare the nursery in rich soil, place in the top of the nursery about half inch with the following mixture and sow the seed one part rich soil, one part sand, one part well decayed cowdung manure and one part coir dust, mix well, shade and water once a day in the evening, avoid too much moisture, seeds will begin to germinate in ten days, one lb seed produces over twenty thousand plants.

We find that plants grown by the above mode are a success and a six weeks' old plant has four eaves.—Yours faithfully, J. P. WILLIAM BROS.

JADOO: A NEW "POTTING" MATERIAL: DOING AWAY WITH SUPPLY BASKETS

Devonshire, Jany 27.

DEAR SIR,—It may perhaps be of interest to give your readers some account of a visit I recently had the pleasure, as one of a party of mutual friends, of paying Col. Halford Thompson, the inventor and patentee of a new "potting" or perhaps, I should say, "GROWING material" for which the "Jadoo" Company has just issued its prospectus; enclosed copy of which will help to fill up the details. The first thing undertaken was an inspection of the various hot-houses and conservatories containing an extensive selection of ferns, shrubs &c., in different stages of growth, all raised and growing solely in Jadoo. Many of the plants were in fine bloom, but what of course attracted my special interest were numerous young Tea seedlings of fairly vigorous growth. That the latter should, with their roots cramped in flower-pots barely of a few cubic inches in contents, show a healthy appearance, forcibly supports the contention that Jadoo supplies in itself an admirable material for nursery purposes. I am convinced that from a nursery formed of good loam with, to the depth of a few inches, an admixture of even only say one-third of Jadoo, the young plants so raised could readily, if not allowed to get beyond a certain size, be removed to the planting field with the material they were grown in still adhering undisturbed to their roots, and so entirely supersede the costly use, and inconvenience of "transplanters." An important feature is that the substance is extremely light, whilst being of an essentially fibrous nature the pots upon removal invariably disclosed an interwoven mass of roots and jadoo that would tax the ingenuity of a more than ordinarily careless cooly to break up. Knowing too well the immense aggregation of loss to proprietors in the past in time wasted, waste of valuable seed and plants—not to say by permanently injured clearings,—which must have been occasioned by the crude system of planting, till quite recently very generally in vogue, which usually allowed the roots to be bared and exposed; the above would point to qualities in jadoo that may prove of much value and utility. It lightens the soil, especially it is claimed producing a heavy growth of healthy feeding roots; and, not in itself subject to decay, it is a question of some interest, as to whether or not a layer if placed around matured plants (tea, cocoa or coffee) a few inches below the surface (of course to be left undisturbed) might not, from its strongly absorbent qualities, form an excellent *permanent medium* in economising liquid and other manures of a quickly solvent character, besides encouraging the formation of a mass of fibrous roots which will form in it.

From the Conservatories we proceeded to the factory conveniently situated with a private siding, close to the railway station at Teignmouth. The manufacture consists principally of boiling the peat litter or moss, with the sundry chemicals used, in large boilers—the real secret of the process however—the culminating discovery of over 11 years' patient experimenting by the patentee—lying in the subsequent reactions set up by certain of the latter under fermentation. Jadoo will, I understand, retain its qualities, if kept under cover, for an indefinite time, whilst, on the other hand, it can in use conveniently be "refreshed," that is to say its fertilising qualities strengthened or replenished when necessary by occasional applications of a concentrated liquid, which forms a second

article of sale the Company anticipate a large demand for. This liquid, I was informed, combines—save the mechanical qualities of the Jadoo fibre—all the valuable properties of the latter as a manure, and can be used independently as such. My visit convinced me that both products, forming as they jointly do the outcome of so long a series of intelligent research and experiment, should wisely be afforded careful trial by horticulturists in the East, generally. Already the fertilised fibre has obtained a sufficiently encouraging recognition abroad to enable Col. Thompson to dispose of the American rights on most advantageous terms to himself, whilst in the West Indies the planting community have been quick to recognise its merits.

C. R.

COFFEE IN NORTH BORNEO.

We notice that the exports of Coffee are shewing an appreciable increase as compared with 12 months ago. The new plantings of the British Borneo Trading and Planting Co. at Segaliud, Kabili, and Sibooga are looking very promising and part will soon come into bearing, while Mr. Goh Tek Seng's planting at Sibooga will also soon help to swell the export. From Kudat we hear very good reports of Mr. Henry Walker's Estate at Taritipan, and Mr. E. Walker is making good progress on his new estate. Mr. Stewart Murray (formerly with Mr. Henry Walker) is proceeding to open near to Mr. E. Walker.—*British North Borneo Herald*, Feb. 1.

VARIOUS PLANTING NOTES.

THE INDIAN TEA CROP for 1896-7 is now estimated at 148,250,000 lb., of which 130,500,000 lb. were shipped from Calcutta up to 13th February. The total for India and Ceylon—although the seasons differ—will be as follows:—

India 1896-7	lb.	148,250,000
Ceylon 1896	lb.	108,141,412
	lb.	256,391,412

As regards the Indian Crop,—

The total for 1895-96 was	134½	million	lb.
„ 1894-95	125½	„	„
„ 1893-94	123½	„	„

so that 148½ for 1896-97 need not astonish us. The total for both countries in 1897-8 at this rate of progress may equal 275 million lb.: so let would-be planters of tea in new countries beware!

CAUCASIAN TEA.—The firm of Widow J. van der Chijs & Zn. of Delft write to the *Indische Mercuur* (in the issue of Jan. 30) as follows (we translate from the Dutch):—

"In continuation of our letters of 19th Dec. last we have now the pleasure of sending you in a separate postal packet, a sample kindly sent to us by Mr. Constantine Popoff of Moscow, of tea grown and prepared on his plantations at Chalon, Kropishoom, and Salibomoouron in the Caucasus by Chinese labourers. We gladly place the same at your disposal." The editor of the *Indische Mercuur* adds the following to the above:—"The analysis made by us of the tea is as follows:—Leaf—good black colour with a trace of reddish and a trace of golden tip, in appearance like a Chinese pekoe congou, somewhat small, equal, carefully prepared and moderately well twisted. Taste—clean, without any decided character, most like a Chinese pakling, good aroma, but not sufficiently moist for Netherlands consumption; colour of decoction, light and transparent; colour of infusion, very nice-looking, golden yellow, which points to a good quality. Our opinion therefore is, that this first experiment is a very great success, and, although the quality is capable of great improvement, this culture, if it develops, may be expected to become a serious rival to the kinds grown in China."

THE CEYLON TEA CROP IN 1897:

I. A. ESTIMATE RAISED TO 118 MILLION LB.

We have just learned from Mr. R. E. D'Esterre, Hon. Secretary to the Maturata and Upper Hewaheta Planters' Association, that, through some mistake, the Tea Crop Committee in Kandy omitted to include the Maturata returns in their total estimate for 1897. Consequently, 1,833,400 lb. have to be added, raising the planters' estimate to 119,083,400 lb. What does our pessimistic evening contemporary say to this? The injury *he* has done to tea proprietors in Ceylon, through under-estimating the capacities of the Colony and encouraging tea extensions in Northern and Southern India—everywhere but in this island—of late years, is beyond reckoning. —Since writing the above, our telegram from Kandy has arrived, showing the P.A. has increased its estimate to 119 million lb. or almost exactly the same as Messrs. Forbes & Walker.

COFFEE PLANTING IN MEXICO.

COFFEE LEAF DISEASE IN THE STATE OF CHIAPAS, MEXICO:

(*By an ex-Ceylon Planter.*)

26th Dec. 1896.

MY DEAR "OBSERVER",—I frequently receive letters from England, United States, as well as elsewhere, making enquiries, and seeking reliable information in regard to coffee planting. I find it very difficult and inconvenient to reply to them: too often the amount of information asked for is not in proportion to the knowledge, which they ought to have of the time at my disposal to reply thereto. Only the other day I received a letter from a gentleman, written from the village where he was born, I suppose: no country was given nor country mentioned in his address. These persons, I have no doubt, wonder why they never receive answers to their letters, and never think their own carelessness is to blame.

This person said he had seen my name mentioned in the *Ceylon Observer*. Accordingly in the hope that he may see this let me tell him to write again—write your name plainly, distinctly, with full address plainly written also. This advice I give to all who care to write to me, and I will endeavour to answer directly or through the columns of the planter's friend—the *Ceylon Observer*.

I do not think this is a good place for

A CEYLON PLANTER

to come to in search of employment as manager of a coffee plantation. Such situations are very scarce, and the wages paid, except only with rare exceptions, are not of such a nature as to induce anyone to embark his fortunes in Latin America.

A Ceylon planter, too, is very much handicapped by other planters resident here—German, French, American, Italian, in fact of every nationality, besides a redundancy of Mexican natives of the country. The first requisite is a good knowledge of Spanish, so as to enable one to do his own business personally, without the services of an interpreter. The methods, too, of doing business in these countries are entirely different to the best way in which we are educated. The Jesuitical doctrine, that the end to be gained justifies the means employed to gain that end, permeates every transaction, and eats into the vitality of every negotiation: accordingly one requires to be very alert, careful, and reserved.

Many persons who come to these countries to teach remain to learn: their lessons too often are very severe. When I first arrived in the neighbouring

REPUBLIC OF GUATEMALA

in the early part of 1883, I thought that the very name of being a Ceylon planter was sufficient to establish me as an authority on such subjects; so it was to a certain extent, but my case was very exceptional and successful. But I readily say that our Ceylon system of coffee planting could never be adopted successfully here, where the same method prevails which is employed in Brazil. The reasons are legion in number and I have written you too frequently regarding them. In a word it is eminently cheaper and simpler, so much so that whatever part of the world I were to go to prosecute the coffee industry I should assuredly work on the lines established in all this continent. Accordingly you see my Ceylon coffee planting education is no use to me. I am one of those who came here to teach and have remained to learn.

Central America stands very high as a large coffee-producing country. It is split up politically into five distinct Republics. The chief of these as a coffee country is the Republic of Guatemala. Last year the harvest reached nearly 900,000 quintals (one quintal is equal to 100 lb. weight.)

It is an accepted fact that

VOLCANIC SOIL

is the very primest for the growth of coffee. Now Guatemala and its immediate neighbour, San Salvador, is nearly altogether of volcanic formation. There are fully 12 distinct volcanoes, ranging in height from 13,500 feet to 15,000 feet above sea level. These volcanoes begin in Mexico, State of Chiapas, and extend in uniform succession throughout the Republic of Guatemala and San Salvador. They are all situated about the same distance from the seashore washed by the Pacific Ocean and not far inland. Their lofty tops look down on the band-like cloud belt, which is often seen to rest more than midway up their sides, like a cotton bandage round a sore finger —scale gigantic. Not a very poetic figure of speech, but that is what I thought one of them looked like the first time I saw it. The upper portions are very rugged and steep; at lower elevations their bases spread out, flatten and broaden and at the usual height above the sea-level a line can be drawn which marks the lower limit of the coffee zone throughout the district of Soconusco, state of Chiapas, thence traversing equidistant from the sea, through Guatemala and San Salvador. From this line reaching upwards is the great coffee belt of Soconusco and Central America.

A PERPETUAL CALM

broods eternally along this gigantic band. The stillness is scarcely ever ruffled even by a gentle breeze. During the rainy season, heavy rain and thunderstorms are the rule nearly every afternoon; but only in the afternoon. During the whole of my sojourn there I scarcely ever remember seeing it rain in the morning. Every morning breaks to display a perfectly cloudless sky, the sun shines with a tropical strength and heat, and to all appearance, were it not for the wet jungle and muddy roads, one would suppose that such a brilliant sky never was darkened by a cloud, or its tranquility disturbed by a storm. After noon, however, the clouds gather with magic rapidity, black and ominous are they, succeeded by heavy rain which pours down, filling and swelling the rivulets and making everything in the way of a stream an impassable torrent.

This is a true description of the climate which prevails in the Pacific slope of Central America, and differs so very widely from that where I am at present situated that I must describe it also. Today is the 26th December and it is just

EIGHT DAYS SINCE I SAW THE SUN.

Two days ago it rained 27 hours incessantly—never stopped a moment. Today we have no rain, but the whole sky is obscured by dense clouds. How many more days may pass before I shall see the blessed face of the sun I know not; but this I will say: that I am very credibly informed that it not infrequently happens that the sun, is obscured for 15 and 20 days consecutively, particularly at this season of the year. The previous 8 days was entirely the reverse: the sun rose in the morning, unclouded sky, and bright and cheerful was the whole day for 9 consecutive days. Here we seldom have thunder. I cannot say I ever heard any during the 9 months that I have been here. Can anything be more opposite or different than the display of the two climates between this place and the Pacific slope of Central America. Yet there are coffee plantations here which grow and thrive wonderfully. The soil is a very deep rich friable loam of volcanic origin.

When I first went to Guatemala, March 1883, the coffee showed a magnificence and a luxuriance of growth and redundancy of foliage, that I had hitherto been a stranger to. From 8 to 12 pounds of coffee was not unfrequently picked off single trees. But in the early "nineties" I noticed

A GREAT CHANGE

particularly in Soconusco and the district in Guatemala called Tumbador, which immediately adjoins Soconusco. The coffee trees seemed to have lost their great and exuberant vigor. Their luxuriant foliage was decidedly lessened, and in their stead an unhealthy sickly appearance had taken its place; the leaves were more scattered on the ground than on their proper place on the treest; the young wood especially would appear weak, was withered and black-looking from the ends leading toward the trunk. In speaking to a friend of mine, a wealthy planter, he acknowledged the difference, and said it was most marked. "They don't seem to me to have half their former luxuriance of growth," is what he said to me. It is needless to say that I soon found out what the cause was. I noticed what to me was an old and familiar face. The underpart of the leaf I noticed was semi-perforated. They were spotted all over with the same marks. No wonder that I was frightened. I thought I had discovered

HEMILEIA VASTATRIX

beyond all doubt. My fear and anxiety, however, I kept carefully to myself; and to make myself absolutely sure, I collected and prepared botanically a little box of the diseased coffee leaves and despatched them to the Director of the Smithsonian Institution of Sciences, Washington, United States, North America, giving him at the same time a description of the coffee trees, as well as a comparison of what they were years before.

The following is the reply which he sent to my letter, which I feel assured will be read with great interest by all planters as well as all those who have capital invested in Soconusco and Guatemala:—

Smithsonian Institution, United States National Museum, Washington, May 22nd, 1894. Mr. W. J. Forsyth, Chiapas, Mexico.—Dear Sir,—The coffee tree

leaves recently transmitted by you for examination have been referred to the Curator of Botany in the National Museum. He has submitted them to Mr. Ellis of Newfield, New Jersey, who states that the disease, which has affected the trees, is not caused by the fungus Hemeleia Vastatrix, but by the growth to which the name of *Stilbum Flavidum* (Cooke) has been given. This, I am told, is quite widespread. Mr. Ellis has in his collection specimens of the same fungoid growth from Costa Rica, Jamaica and Venezuela. Inasmuch as no experiments have been made in this direction no remedies can be suggested.—Yours Respectfully,

G. BROWN GOODE, Assistant Secretary.

(2,683.) (True copy W. J. F.)

A great deal has been written and said about the large profits attending the cultivation of coffee, when all the natural conditions and requirements of the coffee tree unite in certain favored places. and make it produce its greatest and best. This is justly true; but there are many dubious roads, which are said to lead there and pitfalls and precipices where the uncultured can slip and fall. Such a warning I herewith hold out to the unthinking in hope it may lead to some beneficial result. I question if anyone knows that the pest *Stilbum Flavidum* is exercising its powers, and aiding to consummate the extinction of the coffee industry of Soconusco and Guatemala. But it is nevertheless true as the letter I quote amply proves.

This disease is almost entirely confined to the district I have named. Nowhere throughout the state of Oaxaca have I observed any indications of the pest. I have travelled over a large belt of coffee country here and have failed to notice the slightest indications. Considering therefore that there is an absence of the pest in this great and famous state—further that we are removed from the scene of its ravages, fully 150 leagues, with nothing in the way of connecting links to transmit the plague—it accordingly behoves the Government to protect as much as possible the industry here which still remains unblemished in all its vigor and robustness.

I shall now conclude this present paper, wishing you and all my old Ceylon friends a very happy New Year.—Yours truly,

W. J. FORSYTH

THE VENESTA TEA CHEST.

STARTING OF A LOCAL AGENCY.

The Patent Veneer and Metal Case Co., Ld., of London are introducing their "Venesta" tea chest into the island. Mr. A. S. Penny, a representative of the firm, arrived here by the P. & O. ss. "Sumatra" over a fortnight ago and arrangements have been concluded to turn out chests to supply local requirements, the agents being Messrs. Walker, Sons & Co., Ld. Mr. Penny gave a demonstration in putting together the tea chests at the office of Messrs. Walker's today, and was good enough to supply information to a representative of the *Observer.* A standard size will be observed in full, half, and quarter chests. The large chests will be 24 by 19 by 19 in outside measurement, 5 cubic feet for freight, and 8,123 cubic inches inside; and on an average of 73·95 cubic inches to 1 lb. of tea, will hold 110 lb. of tea each. The chest will weigh about 128 lb. with lead, nails, and everything, and 10 chests will go to a ton, shipping. A half-chest will be 20 by 16 by 16 to hold 60 lb. of tea, the weight of the chest being 12 lb.; and quarter chest will be 13 by 12 by 12, holding 21 lb. tea, and weighing only 6 lb. The method of putting the boxes together is simple, and a box can be built up, lead-lined and ready for packing tea within a few minutes. The four sides of the chests are placed in line, a gauge (wire rod) put between to give a certain space and then fasteners of annealed steel are driven in and the points beaten in. One sheet of lead, the length of the four sides is next placed, wooden batons placed at top and bottom and fastened down. The remaining unfastened side of the chest is then secured. About an inch or so of lead remains above the batons. A sheet for the bottom is placed and folded with the lead already fixed down, and the board is then placed in position and fastened. thin, and is made up of three sheets 1-16th of an inch thick each, and pasted together, the grain running transversely, giving the boards great strength with lightness; and an empty chest will bear the weight of a man, the thin plank only bending. The boxes are quite a new idea and only about the end of last year, were introduced into England. The Mariawatta Tea Co., London, are using the "Venesta" chests largely for their Foreign and Colonial trade; and many large estates in India are using the chests, Messrs. Williamson, Magor & Co., being agents at Calcutta. An agency has also been opened in the Persian Gulf, the boxes being used there for the date trade. Agencies are also opened in Australia and New Zealand. Mr. Penny has already secured several orders from upcountry estates, and he will be leaving next Saturday for Mariawatte, East Holyrood, Glenlyon, Waverley and other estates. Mr. Rutherford has placed an order for very nearly 4,000 chests. Machinery has already been put down to turn out 10,000 chests a month, and it is intended to enlarge the work according to requirements.

Besides tea chests "venesta" can also be supplied in large sheets for constructing, lining or partitioning tea factories, stores and bungalows, and being water-proof and an excellent non-conductor of heat, it is believed it can be applied advantageously. In fact it can be put to a variety of uses and we were shown travelling boxes, and hat cases made of the material very strong, light and neat in appearance. In London we are told that small express wagons used by provision dealers are being built, one sheet being used for each large panel. Small bric-a brac, trays and such like are also turned out with advantage.

The firm is at present experimenting in turning out corrugated roofing and expect to be able to supply roofing for estate stores, etc. Mr. Penny believes that it is likely the Admiralty may use the venesta planks for fittings and light work. A great saving is effected in freight and dock charges, etc., by the venesta chests, because more tea goes home under the same measurement, and the chests being very much lighter than other chests more tea goes home under the same dock scale. A saving is also effected in carriage to estates the shooks measuring and weighing less than others; and there is a saving also in the number of boxes used because 22 venesta boxes contain as much tea as 24 other boxes of same external dimensions. Nails and solder not being required a saving in that direction is likewise effected. During the afternoon today, Mr. Penny gave a demonstration in the stores at Messrs. Walkers before a number of those interested in the tea trade. Mr. Scovell, planter, was one of the visitors.

MARKET MANURES AND THEIR ANALYSES.

We append the Draft of a proposed Ordinance drawn up for us by a legal friend and amended in one or two points by Mr. M. Cochran, Public Analyst, who has added two sub-clauses. In returning the Draft, Mr. Cochran writes:

I do not think it is necessary to introduce the distinction in the Ordinance between soluble and insoluble phosphates. In England, it is very exceptional to use a phosphatic manure which does not contain soluble as well as insoluble phosphate. Here, on the other hand, it is just as exceptional to use a phosphatic manure which does contain soluble phosphate.

We would now urge the Planters' Association to take up the matter and call on their representative to bring the draft measure under the notice of Government in the hope that leave may be given to introduce it into the Legislative Council. It would not be the first time that an unofficial member had (with the leave of the President) introduced and carried through a useful piece of legislation.

Our legal friend's draft as amended is as follows:—

AN ORDINANCE FOR REGULATING THE SALE OF MANURES OR FERTILIZERS OF THE SOIL.

Whereas it is expedient to provide against the adulteration of manures or fertilizers of the soil:— It is hereby enacted by the Governor of Ceylon, by and with the advice and consent of the Legislative Council thereof as follows:—

WARRANTY ON SALE OF FERTILIZER: I.—(1) Every person who sells for use as a fertilizer of the soil any article manufactured in Ceylon or imported from abroad shall give to the purchaser an invoice stating the name of the article, and whether it is an artificially compounded article or not, and what is at least the percentage of the nitrogen, phosphates, and potash, if any, contained in the article, and this invoice shall have effect as a warranty by the seller of the statements contained therein.

(2) For the purposes of this section an article shall be deemed to be manufactured, if it has been subjected to any artificial process, or if the seller has declared it to have been manufactured.

(3) This section shall not apply to a sale where the whole amount sold at the same time weighs less than half a hundred-weight.

PENALTIES FOR BREACH OF DUTY BY SELLER. II.—(1) If any person who sells any article for use as a fertilizer of the soil commits any of the following offences, namely:—

(*a*) Fails without reasonable excuse to give, on or before or as soon as possible after the delivery of the article, the invoice required by this Ordinance or

(*b*) Causes or permits any invoice or description of the article sold by him to be false in any material particular to the prejudice of the purchaser, he shall, without prejudice to any civil liability, be liable, on summary conviction, for a first offence to a fine not exceeding one hundred rupees, and for any subsequent offence to a fine not exceeding five hundred rupees.

(2) In any proceeding for an offence under the section it shall be no defence to allege that the buyer, having bought only for analysis, was not prejudiced by the sale.

(3) A person alleged to have committed an offence under this section in respect of an article sold by him, shall be entitled to the same rights and remedies, civil or criminal, against the persons from whom he bought the article, as are available to the person who bought the article from him, and any damages recovered by him may, if the circumstances justify it, include the amount of any fine and costs paid by him on conviction under this section, and the costs of and incidental to his defence on such conviction.

APPOINTMENT OF ANALYST. III.—The Governor shall appoint one or more Government Agricultural Analysts for the land, who shall, while holding the Office of Government Agricultural Analyst, not engage in any trade, manufacture or business connected with the sale or importation of articles used for fertilising the soil. Should more than one Agricultural Analyst be appointed, one of them shall be appointed Chief Agricultural Analyst.

POWER OF PURCHASER TO HAVE FERTILIZER ANALYSED. IV.—(1) Every buyer of any article used for fertilising the soil shall, on payment to a Government Agricultural Analyst of the fee sanctioned by the Governor, be entitled, within ten days after delivery of the article to the buyer, or receipt of the invoice by the buyer, whichever is later, to have the article analysed by the Analyst, and to receive from him a certificate of the result of his analysis.

2. Where a buyer of an article desires to have the article analysed in pursuance of this section, he shall, in accordance with regulations hereto appended, take three samples of the article, and shall, in accordance with the said regulations, cause each sample to be marked, sealed, and fastened up and shall deliver or send by post one sample with the invoice or a copy thereof to a Government Agricultural Analyst, and shall give another sample to the seller, and shall retain the third sample for future comparison: Provided that a Government Agricultural Analyst, or some person authorised by him in that behalf with the approval of the Governor shall, on request either by the buyer or by the seller, and on payment of a fee sanctioned by the Governor take the samples on behalf of the buyer.

3. The certificate of the Government Agricultural analyst shall be in such form and contain such particulars as are directed, in the schedule hereto annexed, and every Government Agricultural Analyst shall carefully enter in a Register to be kept for that purpose, the result of any analysis made by him in pursuance of this Ordinance.

(4) At the hearing of any Civil or Criminal proceeding with respect to any article analysed in pursuance of this section, the production of a certificate of a Government Agricultural Analyst shall be sufficient evidence of the facts therein stated, unless the defendant or person charged requires that the Analyst be called as a witness.

(5) The costs of and incidental to the obtaining of any analysis in pursuance of this section shall be borne by the seller or the buyer in accordance with the results of the analysis, and shall be recoverable as a simple contract debt.

(6) In the event of the results obtained by two or more Analysts, who have analysed samples from the same lot of manure, disagreeing to a material extent, the matter may be referred to the Chief Analyst, who shall take steps, either by analysing the sample kept in each case for comparison, or by drawing and analysing a fresh sample, or by both of these methods, as may seem best to him, to determine the true average composition of the manure; and the results obtained by him shall be regarded as representing the true average composition of the manure.

PENALTY FOR TAMPERING.—V.—If any person knowingly and fraudulently—(*a*) tampers with any parcel or fertilizer so as to procure that any sample of it taken in pursuance of this Ordinance does not correctly represent the contents of the parcel; or (*b*) tampers with any sample taken under this Ordinance, he shall be liable on conviction to a fine not exceeding five hundred rupees, or to imprisonment for a term not exceeding six months.

APPLICATION.—VI. This Ordinance shall apply to wholesale as well as retail sale.

COMMENCEMENT OF ORDINANCE.—VII.—This Ordinance shall come into operation on the 1st day of January 1898.

SHORT TITLE.—VIII.—This Ordinance may be cited as the Fertilizers Ordinance, No.—— of 189—.

THE PLANTERS' ASSOCIATION AND OUR MATERIAL INTERESTS.

Turning to our staple exports as represented by the Association, it is gratifying, after all we have heard of the decay of cacao on certain estates, to note that the crops go on steadily increasing, and that the current year is likely to excel its predecessors. The case is different with coffee—the old Arabian slowly dying out, although the clearing away of bug by the lady-bird beetle might check the decay, while tea is too prosperous, even now, to allow of anything like due attention being given to Liberian. Cardamoms continue to give a good deal of assistance in certain districts, and we sincerely trust that attention to these several bye-products, as well as to Rhea—very properly brought forward by the Association—and some others not mentioned,—may steadily increase. We are surprised, for instance, to find no reference to "Rubber," which ought to grow in importance every year. There is no better repertory of information for the practical planter on the outlook for bye-products, than is afforded in our "Planting and Agricultural Review," prefixed to the Handbook and Directory. The Association has, however, taken a very wise step in calling for a resumption of the advertizing of seeds and plants available from time to time, by the Royal Botanic Gardens; and another wise step would be to ask each of the seventeen District Associations in their annual Reports, or in special communications to the parent Committee, to notice what is being done with new products within their bounds. In this way a good deal about "Rubber" might be learned from Kalutara and Sabaragamuwa; on Liberian coffee from Matale, the Kelani Valley, etc.; on Rhea from Kurunegala and the lowcountry, and so on. It is encouraging to know that the Association is not to lose sight of the need for legislation to provide a check on the quality of manures sold; and that—in the interests of young planters especially—the Midland Jury lists are to be looked after. We are very pleased to see the reference to our late Postmaster-General in the Report. If ever there was a high-minded, progressive official in the Colony, it was Mr. T. E. B. Skinner: and it is astonishing to us that Sir Arthur Havelock, amid all his professions of esteem, did not, in connection with the opening of the new Colombo Post Office, secure some signal mark of honour for Mr. Skinner, who certainly deserved it quite as much as some others who were not forgotten.

The Labour Supply Question is undoubtedly the most important one before the Association and the Planting community generally. It is not necessary, as we have pointed out, to go beyond the Madras Presidency or a people closely allied to our present coolies in race and language, in order to tap a new and populous district and at the same time relieve distress. We refer to the Cudappah, and part of the Arcot, district as worthy of an experiment in recruiting. The mention of Puttalam as the future central port and depôt for cooly immigration is important. We have long urged such a departure in connection with the railway which must one day run direct from Colombo along our North-west coast, while a branch to Anuradhapura would be a necessary adjunct. With the discussion on Mr. Noel's motion, we shall deal in our next.—The explanation given about the new Roads Ordinance is very useful: possibly this may account for the delay of the Ambawela Extension road among other things; but we can conceive how much injustice may be done through setting the value of the road to an estate against the land taken up. Is it not the case that a proprietor would often prefer a road to keep outside, rather than to cut through his plantation? All that Mr. Mackenzie tells us of his work in America is of great interest, especially the fact that India has spent as much as Ceylon in the States. As to "advertising," Mr. Mackenzie has been repeatedly told by us that we do not confine the term to the Press, but interpret the word in the broadest sense and think food-shows, demonstrations and lectures about the very best form of advertising. The "Thirty Committee" again write as if Mr. Rogivue were practically alone working for our teas in Russia. They have surely heard of other big operators—of, for instance, Lipton's House in St. Petersburg sending orders across to London for 2,000 boxes at a time. It is very satisfactory to find the Association taking an interest in the "Arrack" problem—a question, we suspect, which lies at the foundation of the greater part of the serious crime in the island; but is it not rather reversing the usual order to say the Committee will wait for the Commissioner's Report? By the way, how absurd to have a Commission made up of one member? We do not know if this is because Mr. Ellis did not care for associates, like the dissentient juryman who said that his eleven colleagues were the most obstinate and wrong-headed men he had ever known. Certainly, on this most difficult and complicated Arrack question, there should sit a representative, though carefully picked, body of Commissioners, some of whom should be native gentlemen as most intimately acquainted with the ways and feelings of the people in the principal rural divisions of the island. Perhaps, the Governor only means Mr. Ellis's Report to be regarded as a preliminary one, to indicate the policy as to which a duly-constituted Commission should enquire and take evidence?

PLANTING PRODUCTS.

(Extracts from the Forty-third Annual Report of the Ceylon Planters' Association, held 17th Feb. 1897.)

TEA.

The season generally has been a fair average one. Taking the Chamber of Commerce returns, the increase in crop as against 1895 is 10,201,541 lb. The total exports reaching 108,141,412 lb. of this 11,205,051 lb. were shipped direct from Colombo to ports other than the United Kingdom, or an increase of exports direct to outside markets of 2,018,519 as against 1895, which may be considered very satisfactory, more especially as the Home exports of British grown Teas show an increase of 5 millions on last year—1895. There is also the very satisfactory increase in Home consumption of British grown Teas of 11 millions over last year, which itself showed an increase of 7 millions over the year before. Everything points to increased foreign consumption during 1897, more especially in America and Russia, where your Commissioners (Mr. Mackenzie) in the former, and Mr. Rogivu, in the latter, continue their good work with energy. The average London price was 8¼d per lb. as against 8¾d per lb. for 1895; but results, taking the year as a whole, are satisfactory, and confidence in your staple is maintained, while it is generally considered that there is no safer investment than Ceylon Tea property. Extension of planting still con-

tinues in a small way, and the demand of Tea seed is quite as strong as it was in 1895. Labor was short during the busy months—March-May—in some districts, notably where estates lie some distance from the main road. Extension of cart roads is a matter of necessity, and should be pushed on with activity, as not only do coolies dislike the carriage of Tea chests, but transport by coolies takes away a considerable force from the pluckers.

COCOA.—As anticipated in last year's report, crop for 1896 exceeded that of 1895, the figures for the last four years being: 1893—29,775, 1894—22,791, 1895—27,522, 1896 cwts 33,890, from which figures it may be inferred the crops for 1897 will probably be the largest yet picked, cwt. 35,000 being perhaps a fair estimate. Some anxiety was caused during the past two years by reports received of cocoa trees dying out in rather a wholesale way by the ravages of a small borer beetle, and your Committee considers the matter worthy of the most careful attention. The position of the home market is encouraging, the demand having largely increased whilst the imports have not done so. For the first time for some years the deliveries from London and Havre show more signs of catching up the imports. The following extract from Messrs. Wilson, Smithett & Co.'s circular of recent date gives interesting statistics regarding Imports, Consumption and Stock. (Already given in the *Observer*).

CARDAMOMS.—The forecast of your Committee in last year's report has been borne out—Exports being in 1895 435,090 lb.; in 1896 463,233 lb. The prices realised have also been exceptionally in favour of growers.

ARABIAN COFFEE.—Where this cultivation is maintained there is little encouragement to increase the area by planting up fresh land or keeping up old bushes in first class order.

LIBERIAN COFFEE.—A very small area of this product has been planted, and its success may be hoped for.

RHEA FIBRE has so far only reached the stage of striking, cuttings, nurseries, &c. Kurunegala so far has been the basis of such operations. Keen interest is taken in the matter, and if sufficient evidence is forthcoming of its profitable culture, there are many enterprising planters who will take up land for its cultivation.

CROTON-SEED.—The fine prices ruling two or three months ago made the fortunate possessors of this product pay some attention to the cultivation.

OFFICIAL ESTIMATE OF THE TEA CROP FOR 1897. —Your Committee has decided to estimate the tea crop for 1897 at 119,000,000 lb.

NEW PRODUCTS, FOREST RESERVES.—Your Committee feels that the present prosperity of Ceylon generally affords a favourable opportunity to invite renewed attention to the important question of new products in connection with which a Commission was appointed in 1881 by Government at the instance of your Association. As an Appendix to the Report of the Commissioners (*vide* Book of Proceedings of the Association for the year ending 17th February, 1882) there is printed a memorandum on the part taken by the Royal Botanic Gardens, Peradeniya, in the introduction of useful plants into Ceylon in which the late Dr. Trimen remarked as follows: "Appended to this memorandum is an advertisement from one of the local newspapers of the plants and seeds on sale at the Gardens in June 1881. Such advertisements are now prepared quarterly by the Director, and have, it is believed, considerably tended to the spread of 'new products' in the Colony." Your Committee would bring this matter before Government, and urge that the "advertisement referred to" should again be regularly prepared quarterly and prominently advertised in the "Government Gazette," in the local newspapers, and by printed circulars in the vernacular for distribution widely among cultivators. As regards forest trees, your Committee would remind Government that the late Dr. Thwaites in the year 1879 asked that he should receive instructions to form both at Peradeniya and at Hakgala Gardens, nurseries for supplying at a moderate rate of charge, young plants of suitable kinds for the convenience of planters who may require them for reservations. Dr. Thwaites further annexed under lists A. B. & C. those species he considered most suitable, both indigenous and exotic, of which seeds could be obtained without any great difficulty at their proper seasons.

Your Committee desires in this report to record the universal regret felt at the untimely death of the late Director of the Royal Botanic Gardens, Peradeniya, and the sense of loss that has been thereby sustained not alone in the departments of learning in which Dr. Trimen was conspicuous, but also among the Planting Community in whose interests he at all times evinced the keenest regard, and for whose progress he laboured in so many ways.

LABOUR LAWS.—Some recent decisions of the Supreme Court have been the subject of consideration and discussion, and while it cannot be said that any remedy has been found for such mistakes, or that a solution of the difficulties that follow has been arrived at, it was unanimously resolved by your Committee that it would be unwise and inexpedient to endeavour to re-open the existing Labour Ordinances, which, on the whole, when reasonably interpreted, afford considerable protection to all interested in the Labor Question.

LABOUR SUPPLY.—Your Committee appends Abstract of the Official returns showing the arrival and departure of coolies for 1896, also for comparison the similar table for 1895.

[Table given already in *Observer*.]

Your Committee is further able, by the courtesy of Government. to invite attention to the following Immigration Returns, compiled by the Master Attendant, Colombo, showing the number of Indian coolies that have come to Ceylon annually for the past five years, 1892-96, *via* North Road and *via* Tuticorin respectively:—

RETURN SHOWING THE NUMBER OF INDIAN ESTATE COOLIES WHO HAVE COME TO CEYLON *via* THE NORTH ROAD FOR THE PAST FIVE YEARS.

Year.	Number.
1892	45,687
1893	34,564
1894	39,062
1895	31,448
1896 (up to 30 h November 1896)	29,442

RETURN SHOWING THE NUMBER OF INDIAN ESTATE COOLIES WHO HAVE COME TO CEYLON FROM TUTICORIN AND TONDI FOR THE PAST FIVE YEARS.

Year.	Men.	Women.	Total.
1892	21,583	7,381	28,964
1893	12,235	3,975	16,210
1894	12,864	3,936	16,800
1895	28,519	9,717	38,236
1896	36,135	11,906	48,041

Year.	Children.	Infants.	Grand total.
1892	4,689	3,655	37,308
1893	2,710	1,455	20,375
1894	3,038	1,257	21,095
1895	9,259	2,687	50,182
1896	9,015	3,412	60,498

SUGGESTIONS FOR INCREASING IMMIGRATION—PASSES TO COOLIES FROM TUTICORIN TO COLOMBO BY STEAMER—THROUGH BOOKING OF COOLIES FROM INDIA TO CEYLON—BLACKMAILING OF COOLIES AT STATIONS ON THE SOUTH INDIA RAILWAY AND ELSEWHERE.—All the abovementioned subjects have received a large share of the time and attention of your Committee during the past year, and satisfactory results have been attained. In the matter of the alleged Blackmailing of coolies especially, the thanks of the Association are due to both the Ceylon and Madras Governments for the keen and effective interest and action that have been taken with a view to putting a stop to Blackmailing, while interesting and valuable reports have been transmitted for your information and guidance by Government.

QUARANTINE REGULATIONS AT COLOMBO.—In view of the fact that the course of immigration is now being largely diverted from the land to the sea route, it would seem advisable to look to some other port than Colombo for a terminus. During a recent outbreak of cholera on the Mainland quarantine had to

be established at Colombo, and the steamer agents consequently found themselves unable to continue the service of conveying coolies. Such a state of affairs is always liable to recur, but would be disastrous in its results. Your Committee hopes that, on the occasion of the extension of the railway now proposed Northwards, it may be found possible to serve Puttalam, and to establish in that neighbourhood a landing station for coolies, available and safe at all seasons.

ORDINANCE RELATING TO CLAIMS TO FOREST, CHENA, WASTE, AND UNOCCUPIED LANDS.—The above-mentioned Ordinance, which has recently passed the Legislative Council, gave rise to considerable apprehension, and your committee felt that in connection with such Ordinances especially the views of the Planters' Association of Ceylon should have been expressly invited by Government, ample time bing given to all interested to consider them. A Sub-Committee was appointed to look into the Draft Proposed Ordinance as it appeared in the *Government Gazette*, and it was resolved to point out that in the opinion of the Sub-Committee Section 19, sub-sections A.B.C., would arbitrarily prejudice many persons in their just proprietary rights, and shake the confidence of investors in all landed property. With regard to the principle ot the bill the Sub-Committee was of opinion that the Occupier of Land should under no circumstances be made the claimant, but that if it should be necessary to take action against him, he should be the defendant. Further, that though it is desirable to give legal effect to agreements arrived at between the Government Agent and the occupier, the Government Agent should not be allowed to adjudicate if an agreement cannot be come to, but that the case should go to a properly constituted Court. It was felt that in all cases ample time should be given to claimants for the proper defence of the action, and to safeguard the interests of absentees, and that no Government official that had at any preliminary inquiry been a party should be appointed a special Commissioner. The attention of the Planting Member in Council was drawn to these and to other points when watching the proposed Ordinance at the various readings in the Legislature. Your Committee, while adhering to the views expressed by the Sub-Committee, deem it advisable to annex as an appendix to your Committee's Report for further reference and guidance an extract from the speech recently made by His Excellency the Governor in reply to some observations on the subject submitted to him in an address by the Northern Districts Association.

PRÆDIAL PRODUCTS THEFTS COMMISSION.—The result of the Prædial Products Commission from the standpoint of Government as regards remedial and deterrent action may be summarised thus. In view of provision of Ordinance No. 16 of 1865 the Government does not consider further legislation necessary in respect of the recommendation made in Paragraph 29 of the Report of the Prædial Products Thefts Commission. Paragraph 29 reads,—"We recommend, however, in the present instance, the establishment of special police in the districts which suffer from thefts, the estates which desire such protection and are willing to contribute towards the cost of it. We consider that the reality of any complaints about the prevalence of theft may be fairly gauged by the willingness of those who complain to contribute towards the suppression; and we are therefore of opinion that whenever two-thirds of the owners of estates in any locality are willing to pay for a special police force, this is in itself sufficient to establish the existence of a state of affairs which renders it the duty of Government to pay a moiety of the cost of such police, and we advise that the application of this system should be sanctioned in any district or locality where such police are applied for."

The Government considered the proposed amendment of section 14 of the Ordinance, recommended in Paragraph 32 of the Report, undesirable. Paragraph 32 reads.—"The system here recommended is, in its general features, already provided for by sections 14 to 22 of the Police Ordinance No. 16 of 1865, and it seems singular that the northern districts, where thefts are most prevalent, should not have availed themselves hitherto of the provisions of this Ordinance.

"We consider that the Ordinance should be amended by the substitution of five acres for twenty-five acres in section 14, and that in section 15, proprietors should, in addition to giving the number of men, be required to state whether regular or rural police are required, whether they desire police stations or patrols, and whether they would wish the force to consist of local residents or of persons enlisted elsewhere; in other words, they should give a general outline of the scheme they wish to have adopted."

With regard to the recommendation made in paragraph 34 of the Report, His Excellency the Governor was pleased to order the relaxation of Section 17 of the Rules and Regulations made under Ordinance 32 of 1891, and published in the "Ceylon Government Gazette Extraordinary" No. 5,159 of August 6th, 1892, so far as to leave to the Government Agents the selection of such men as may be employed as special Police in the suppression of thefts of Prædial Products.

NEW MARKETS FOR TEA:

THE THIRTY COMMITTEE.

The Committee's Report is as follows:—

In presenting a short statement of the work of the "Thirty Committee" for the year ended 31st December 1896, it may be useful to remind those interested that the Fund now being employed in pushing and advertising Ceylon tea throughout the world, but of course especially in the United States of America and Russia is the proceeds of the levy of an export duty on tea of 20 cents per 100 lb. under the Ordinance No. 4 of 1894. The money so collected is applied "towards increasing the consumption of Ceylon tea in foreign lands in such manner as may from time to time be determined by the Joint Committee appointed for the purpose by the Planters' Association of Ceylon" and "by the Ceylon Chamber of Commerce," now known as the "Thirty Committee," subject to the approval of the Governor in Executive Council. Since the commencement of this arrangement the sum of R453,550·56 have been paid into the Bank for credit of the Ceylon Tea (New Markets) Fund up to the close of the past year. Of this sum according to the accounts kept in Ceylon £16,663 6s 10d equal to R282,847·17 had been drawn for by the present Ceylon Representative in America (Mr. Wm. Mackenzie) exclusive of local payments for tea samples, photographs, &c., while a sum aggregating R25,872·49 has been paid to Mr. M. Rogivue for disbursement in Russia on the lines laid down for this direction.

CEYLON TEA IN AMERICA.—As regards Mr. Mackenzie's work in America the following Report has been received written in the general tone, and which cannot fail to greatly interest all who have watched the progress of the tea campaign in the United States and in Canada. Mr. Mackenzie writes:—"As the day of the annual meeting of the Association is drawing near, it would perhaps be well that I should furnish you with some general notes of what has been done in America with the funds so liberally supplied to me during 1896.

Minute particulars with details of expenditure in a matter of this kind must necessarily be for the Committee only, as it is not advisable to disclose the dealings of any firms of Tea Merchants to overy other rival. The Committee knows from my letters and from my accounts, exactly the lines in which I am working, and if they are satisfied, I feel certain the general body of planters have sufficient confidence in them, to allow details in the meantime to be between the Committee and me.

But without touching upon any point in a way to disclose their business, and thus offend any of the firms, energetically working with us, and on our behalf, it may be possible to describe generally what is being done in a way that may be of interest to the subscribers to the Fund, *i.e.* the whole planting community.

It must already be well-known to most Ceylon planters that the Americans are not a tea drinking people. In Britain the consumption of tea is 5¾ lb. per head, of coffee, a fraction. In the States, tea is a little over 1 lb. per head, coffee between 8 and 9 lb. This may seem strange to those who still regard the Americans as "flesh of our flesh." That might have been true at one time, say even to fifty years ago. But the immigration of Germans, Austrians, Hungarians, Italians, Poles, and Swedes has been for many years very much greater than that of English, Scotch, and Irish. Last year's statistics of immigration show the number of arrivals of Italians for the year, as 57,000 and of Austrians and Hungarians 57,000. No other nation at all approaches these figures.

Then the descendants of the old English settlers in the east and south are well-known to resemble the French in having very small families. It is stated that two children of European descent are born for one of British in the U.S.

Another reason for the non-use of tea is, that it is generally *so bad* in the States, while coffee is universally better than in Britain. A Tea Merchant told me that when new factories were built in Buffalo some years ago, he did a very good trade *for a year*, with a lot of Irish and Scotch labours who were specially imported to work the factories. During the second year these customers of his dropped tea, and took to coffee and he gave me as the reason that they did not care for American tea (green) and found American coffee a delightful surprise. I have frequently heard it said that a *man* who drank tea was in America called a "Jenny," that is, was effeminate.

The following cases may be regarded as typical of at least four-fifths of the people of the States.

A gentleman who was born in America, of German extraction is agent for an English firm who are pushing our teas vigorously over there. He told me he drank *one cup of tea a week* on Sunday. His wife told me she had never tasted tea until her husband took it up 6 months ago. Since then he had several times made her try to drink a blend of Ceylon and Indian tea, but that she always felt sick when she took a mouthful, and had to give it up.

This gentleman introduced me to one of his travellers, whose duty it was to push the tea, I asked him how he liked our tea. He said that he thought the best way to arrive at an opinion as to its chances with American people was, to try to get his father, mother, sisters, brothers and cousins (twelve in all,) who were tea-drinkers to use it. He took home a packet, carefully attended to directions as to boiling water, quantity of tea, and time of steeping &c. and got all to take a cup. He told them they would not like it at first but induced them to persevere. On the third day the father said "Tom, if it will do you any good, I'll go on drinking this tea, but it is horrible." The mother refused to drink any more of it, whether Tom benefited or not: and the other relations insisted on going back to the old green variety.

Now, those people had an object in trying to drink our tea, but they could not overcome their dislike. What chance have we then with those who have no such object? These cases are not singular, I could give many similar experiences among those whom I gave some tea with directions for making &c.

Among black tea drinkers—a fifth of the population—our progress is easy. But to the majority—the vast majority—green tea and coffee drinkers, a cup of our tea, especially as they make it—putting as much in the pot as they do of weak Japans and allowing it to draw 10 to 20 minutes, is as nauseous as margosa oil would be to a Planter! No wonder an American Doctor by whose family I got our tea used for 12 months, told me last month that unless carefully made and drunk within a few minutes it *was poisonous*. We would all think it abominable if we made it, as Americans make their tea.

Any unprejudiced person must see from the above that beyond the region in which black tea is drunk, our progress must be very slow. The question is, if we are to persevere, what is the best method to pursue. A proverb says "you may take the horse to the water, but how are you to make him drink?" I see one Ceylon Paper repeatedly has advised that the whole Fund should be spent in Press advertising, that is *in letting the horse know the water exists somewhere.*

In America, editors of Journals, A & B, say that the rival Editors of Journals, C & D, believe that when they (the latter) are engaged in sneezing Providence kindly halts. The former Editors admit the halting, but not that it is to Editors of C & D that the consideration is extended! The Press is powerful, but even if it made a few ask for an article advertised, it cannot make merchants interested in a rival article hold it. That is of course, unless the funds at the disposal of the Advertiser are practically unlimited. The matter was settled long ago as far as we are concerned. The Committee may remember that I had a difference of opinion with advertising Agents last year as to the best means of spending our Fund. They naturally said *in the Press through them.* My enquiries elsewhere led me to believe differently. The Agents proposed to leave the matter to be decided by a gentleman known to them, who was acknowledged to be the smartest advertiser of Grocery Articles in New York. This gentleman kindly agreed to judge between us. I allowed the Agents to state the case, which they did quite fairly. The expert's decision was in my favor. He said if your Fund is £100,000 go to the consumer through the Press and otherwise, but with £10,000 only, you must "interest" the Trade.

Since then I see the advice given is "leave all to private enterprise. If you interest part of the Trade, you create jealousy among the others." Those we assist are Firms who do Educational Missionary work in many large towns and even in villages, by having tea stalls in grocers' stores, at Church Fairs, Ladies' Charity Meetings, bazaars etc. by supplying house to house canvassers, distributing samples, circulars, pamphlets, instructions for making &c., and who, when making those efforts in any centre, advertise in the local papers at the same time. It is by such means that every new article of food is introduced in America. Americans are great celebrators. Every local centre has many events which are "celebrated" yearly, and such gatherings afford opportunities for exhibiting our tea, a baking powder, a new cereal product, &c. It would be quite impossible for the two associations to make use of one-tenth of such occasions as are turned to account by our numerous allies.

Last year, 1895, and in the early months of 96 we did a deal of such work, because at that time, our friends were comparatively few. But our efforts, besides being necessarily few, were of much less avail than those of firms because we were not tea-dealers, and could only refer enquirers to their grocers, who nine times out of ten either had none of our tea or sold them some Chinese mixture instead. Large wholesale firms "demonstrating" our tea, can refer enquirers to hundreds of grocers in every large town, where their blends and packets are handled. The girls in charge of these demonstrations teach the people *how to make the tea*, and show them that it is palatable, as made by them. They give away samples &c. The wholesale firms shift these demonstrations from shop to shop. Unless something of this sort is done, grocers will not hold the tea to give it a chance.

Now all this "demonstration" is expensive, and unless we assisted those who undertake it, it would not be done for our tea. The strong firms now working for us, would push the trade in America just the same, but it would naturally be a trade in teas which are generally drunk, which would require little or no demonstration, and which while giving much less trouble, would yield a higher profit. What object would they have in pushing British grown teas at a vast amount of trouble and expense, when an open field is there for them to supply the existing demand for green and unfermented leaf.

I feel certain that if we withdraw aid entirely now, these firms would naturally slip into supplying such teas as the people want. What is there in our

tea that we should expect merchants to lose thousands of pound in pushiug it, when they could make a profit by supplying other tea ? Many of those helping us, do so because they believe they will eventually recoup their immediate losses, being the first in a trade which they foresee our effort will make, if we persevere. It is not so much becuse of the amount we can give in aid of their work, as because they know if they do not fall in with us, their rivals will. This is clearly shown by a circular addressed by a leading American firm to their 16,000 grocer customers, in which they say they are obliged to put up a packet of Ceylon and Indian tea because "English packers" assisted by the Association would otherwise get 1-10th of their trade. *That tenth*, they say, is practically all the black tea drunk in America. The balance beiug green or unfermented teas. The Chairman has copy of this circular.

Jealousy and *rivalry* are elements of all trade—little would be done were everybody content. I am glad we have created those feelings in America, *and I do no believe we have created them in Colombo.* True much of the tea sold by our strong London allies may be bought in London, and much of that used by our numerous American friends may be bought in London or New York. It may also be true that Colombo firms would like get to those orders, and that some of them are jealous in consequence. But the tax from which the Fund comes *is paid by the growers and is intended to benefit the planters*—not the numerous petty Agencies which may exist in Colombo. Agents or Colombo Merchants are so much mixed up with planters as Shareholders and Directors of Companies, that may be difficult to separate their interests. But I feel certain such firms as Messrs. George Steuart & Co., Messrs. Robertson & Co., Bosanquet & Co., Whittall & Co., &c. are not in any way jealous of London or American Houses who, at an expense three to six times greater than our subsidies, do all the educational work now going on in America. If there are Firms "consumed with jealousy," why do they not engage in this work themselves and come in for some crumbs from the fund? At present they only execute orders. Now I take it, our Fund was intended to create a demand—not to subsidize such as merely execute orders.

When the planters see no further use for the "Cess," let them get it withdrawn by all means, but they should not be influenced by insinuations of jealousy I have entered at length in this phase of the subject, because I notice an effort has been made to create disuuion and disaffection. But if it be true as I see in the Colombo papers that the Committee has granted £12,000 for America in 1897, it proves that the gentlemen forming the Committee believe the methods I have pursued to be such as we may expect to produce results. But I shall welcome suggestions reduced to what the Americans call "practical propositions" believing that *definition* would do more good than vague *denunciation*.

As to the results of our work so far it is difficult to speak with confidence as to actual figures. I believe myself that the consumption of our teas in 1896 was double that of 1894 I say *consumption* not *importation*, because we began 1896 with a large stock in hand in America. The Presidential Election too upset trade in 1896, so much that few Merchants would touch a new article. But duriug the last three months, I believe it will be found, that the exports to America from London, Calcutta, and Colombo were very large indeed.

Whatever may be results, I can speak confidently of the *great extension of the efforts made in* 1896—especially during the last eight months of the year, to introduce our teas into Stores, to open up new fields for them, and to make them know to consumers in all States East of Chicago. And these efforts have undoubtedly been attended with great success. Some Wholesale firms have now several hundreds of Grocers in each of several large towus, selling our teas. I could tell much more in this direction were it not that I think it better not to publish details of other people's business. But the Committee are in possession of a mass of information bearing on the point, and a few words from the Chairman will suffice to satisfy the subscribers that their money is not being wasted.

I may give a few instances of what is being done. In one very large Store recently built in New York, six rival firms had stalls for weeks, where our teas were exhibited. That is the girls m de tea, offered it to customers, who entered the store, gave away samples, circulars &c. In another rival store close to this one there were three stalls running last month. In Chicago I found one store with four. In Philadelphia I saw the best exhibit of the kind I met anywhere. One of our strongest allies—an American Firm—had an enormous booth in a Food Show—about a quarter of the immense Hall—beautifully decorated with palms, flags &c. where a lady well known in Ceylon with 14 *girl assistants* welcomed all comers to taste a cup of pure Ceylon or Indian tea. The place was crowded daily.

All towns are not as large as New York, Chicago, or Philadelphia, but in many towns on a scale in proportion to population, this sort of thing is going on constantly. Wherever we can get this kind of work done in a town by two or three wholesale houses simultaneously, we draw the attention of the public by advertisements in the daily press. We have recently taken up Buffalo and Pittsburg, and are arranging for extending to three other towns at once.

We advertise in 22 leading papers in the Eastern States, besides numerous magazines, and ladies' newspapers.

I may here be allowed to sound a note of warning. Whether it be that *quantity* rather than *quality* is now the aim of most Ceylon planters, or that the teas are really deteriorating, I cannot decide, but no one can deny that compared with teas from India, Ceylon teas are rapidly falling in value. Broken pekoes are no longer in request. Coarser leaf teas are used in blends to bring down the average cost to the blender, while Indian teas supply the point and quality. Ceylon teas are quoted 5d to 6d, dangerously near the price of Chinas.

Our best customer in America has written to me that the largest American Tea Firm—hitherto unapproachable by us, has sent him samples of machine-made China tea as a substitute for Ceylons. He says they are very like Ceylon broken pekoes in style, but fail in cup qualities. He adds they may well "interrupt" the sale of our teas to inexperienced dealers. Everything points to this, *that quality not quantity should be the aim of all in 1897.*

CEYLON TEA IN RUSSIA.—Letters recently published together with statements of accounts, received from Mr. M. Rogivue have already supplied all information possible, and as these papers will be included in the Book of Proceedings of the year it is unnecessary to recapitulate their contents. They afford evidence, however, if evidence were wanted, that vigorous efforts should continue to be made to make known Ceylon tea in the vast Empire of Russia, and that steps should be devised as soon as possible largely to increase the demand for Ceylon tea by that tea drinking nation.

In view of the large area of the country to be worked, and the great value of the trade, if acquired, it may be necessary to supplement Mr. Rogivue's efforts by independent agencies. No one man, howevar energetic, can cope with trade of the whole empire, and no efforts I should be spared to interest those already engaged in tea in our produce.

CEYLON TEA AT INTERNATIONAL EXHIBITION AT GENEVA.—With a view to following up previous small grants to different applicants who had been pushing the sale of Ceylon tea on Switzerland, and on the recommendation of Mr. Wm. Mackenzie a sum of £200 sterling was paid to Messrs. Tetley & Co., who had represented that the Geneva International Exhibition would afford a most favourable opportunity to push Ceylon tea in Switzerland and the neighbouring countries. It was proposed that Messrs. Tetley & Co. should share with two Swiss firms a chalet to be erected in the grounds. In this chalet they

were to have an attractive tea exhibit and by infusing Ceylon tea to enable all visitors to judge of its superiority over the China tea, most of them had been in the habit of drinking. They stated further that they anticipated so good results that they had made arrangements for appointing agents in all the principal towns in Switzerland, and that they contemplated doing so also in the nearer towns which lie outside the frontier. In acknowledging receipt of the £200 paid to them through the Secretary, the Ceylon Association in London, Messrs. Tetley & Co. intimated that that they would furnish full particulars of what they had done for the information of the "Thirty Committee." So far the promised report has not been received, and attention has been drawn to the matter.

Ceylon Tea at the Empire of India and Ceylon Exhibition London, 1896.—At the request of Mr. E. E. Green, it was decided to support him in his application for support in connection with the concession he hoped to secure for a Ceylon tea house at the Empire of India and Ceylon Exhibition 1896; but unfortunately Mr Green had to withdraw his application owing to the action of the Exhibition Directors.

Ceylon Tea in Norway.—During the year a grant was made of 300 lb. of Ceylon tea for free distribution in Norway by Mr. A. Floor at Bergen, while a grant of 200 lb. was also made to Mr. Paliser for free distribution, in various towns and districts in Norway.

Ceylon Tea in Belgium and Holland.—On the application of Mr. E. R. Templer—who was well recommended—a grant of 1,000 lb. Ceylon tea was made to him on terms together with a sum of £25 sterling to be extended in advertising Ceylon tea in Belgium and Holland.

Ceylon Tea on the Continent of Europe: Mr. R. V. Webster's Application.—In response to Mr. R. V. Webster's offer to distribute samples of Ceylon tea in bulk and packets throughout the Continent of Europe, provided the "Thirty Committee" gave him some support in advertising, a sum af £500 sterling was granted to him for the purpose indicated. Mr. Webster intimating that he will hold details of expenditure at the disposal of the Committee.

Ceylon Tea in Austria and Hungary.—During the past year various applications have been received for grants in connection with pushing Ceylon tea in Austria and Hungary, but so far exaction has been referred.

Finances.—The usual abstract of accounts for the half-yearly periods ended 30th June 1896, and 31st December 1896, are appended.

ABSTRACT OF THE CEYLON TEA (NEW MARKETS) FUND ACCOUNT FROM 1ST JANUARY TO 30TH JUNE 1896.

Dr.	R.	c.
To National Bank of India, Limited ..	147,377	51
,, Albion Press	20	00
,, Telegram account	92	90
,, Secretary	500	000
,, Ceylon Tea in America (Telegrams account)	55	50
,, Mackenzie, Wm., Representative in the United States £6,786-17-4 ..	116,071	32
,, Charges	2	50
,, Ceylon Tea in Russia	12,935	02
,, Ceylon Tea in Norway	386	00
,, Philip & Co. A..	1,000	00
,, Petty Cash	60	61
,, Postages, Petties and Sundry Disbursements	181	45
,, Peon's Services...	120	00
	R278,805	81

Cr.	R	c.
By Balance National Bank of India Limited as per previous statement	162,545	00
,, Balance in Petty Cash as per previous statement	115	06
,, Ceylon Tea (New Markets) Fund ..	112,273	00
,, Ceylon Tea Fund	2,496	15
,, Interest	1,376	60
	R278,805	81

E. & O. E.—D. W. D. S.

Kandy, 30th June 1896.

ABSTRACT OF THE CEYLON TEA (NEW MARKETS) FUND ACCOUNT FROM 1ST JULY TO 31ST DECEMBER 1896.

Dr.	R	c
To National Bank of India Limited ..	134,290	59
,, Mackenzie Wm. Representative in the United States £6,400-0-0 ..	104,667	88
,, Ceylon Tea in Russia	8,552	33
,, Ceylon Tea in Switzerland ..	3,420	94
,, Ceylon Tea in Norway	170	25
,, Ceylon Tea in Belgium and Holland ..	1,005	32
,, Philip & Co. A.	1,000	00
,, Petty Cash	156	24
,, Postages, Petties and Sundry Disbursements	199	50
,, Peon's Services..	120	00
,, Charges	84	87
,, Ceylon Tea in America (Telegrams) ..	78	10
,, Miscellaneous account	375	00
,, Secretary	500	00
	R254,621	02

Cr.	R	c.
By Balance in National Bank of India Limited as per previous statement	147,377	51
,, Balance in Petty Cash as per previous statement	60	61
,, Ceylon Tea (New Markets) Fund ..	104,091	79
,, Ceylon Tea Fund	1,697	54
,, Interest	1,393	57
	R254,621	02

E. & O. E.—D. W. D. S.

Kandy, 31st December 1896.

JADOO AND NITRAGIN.

The Principal of the School of Agriculture writes:—

"I send you a sample of Jadoo Fibre, the new "growing medium," which has been well spoken of. The manufacturers in Exeter have been good enough to send me 10 bales for trial, and I shall be glad to supply those interested in jadoo with small quantities for trial on their own account.

"I also send you a specimen bottle of 'nitragin,' or pure cultivation bacteria for leguminous crops, which has been sent me by the manufacturers. The parcel from Germany should have reached me more than a month ago, but through an error, was sent to the Sanitary Officer, with whom it has been for some weeks. The accompanying copy of the 'Agricultural Magazine' contains on page 55 the directions for use of nitragin."

Both of these samples can be seen at our office by any one interested. As the instructions referred to are, like all in the useful "Agricultural Magazine," embodied in our *Tropical Agriculturist*, we need not repeat them in the *Observer*.

THE INDIAN AND CEYLON TEA CROPS.

A merchant lately asked us:—

"Is there any ready means of comparing the total grading of Ceylon teas with Indian, for, say, a year? This might give an indication as to which country plucks finest, and possibly accounts for difference in rates."

The only information we can get is from a tea-dealer who says that the proportion of "fine" Indian teas (Darjeelings, &c.) is ten per cent of the total Indian crop; while the proportion of "fine" Ceylons (Nuwara Eliya, &c.) is only 3 per cent of the Ceylon crop. If this be correct, it certainly explains to some extent the higher average for Indian tea; but would it not be possible to work out the total quantity of Broken Pekoes and Pekoes in the Indian and Ceylon sales for a year in order to offer a further comparison?

While on this subject we may quote the somewhat epigrammatic and contradictory statement of an old resident who follows the local tea industry very closely:—

" ——— is the exponent of *quantity* versus *quality*. If we all did what he does 150,000,000 lb. would be the export of Ceylon tea for 1898. If we go in for *quality*, the dealers will have us on the hop, and give us ordinary prices for it and then import cheap tea from China to mix with it. It is our common teas that have enabled us to chuck China tea out of consumption."

INDIA RUBBER FOR CEYLON PLANTERS.

"J. M.'s" letter in another column appears at the right time. We feel that it was a great omission in the Planters' Association Report that no reference was made to rubber, and, we trust our suggestion as to collecting information on this and other minor products, from the District Associations, will be adopted another year. Meantime, it is of interest to know that very shortly a series of experiments in harvesting rubber is to be undertaken at the Henaratgoda Gardens and that the results are to be carefully noted and published for the guidance and, we trust, encouragement of planters. Every year, too, should make the areas cultivated with rubber under the direction of the Forest Department, more interesting, and it should soon be time to institute tapping experiments, so as to judge year by year, what is the best and most profitable time and mode to harvest the crop. Then if planters, with an appreciable number of rubber trees or creepers and a certain amount of experience in cultivation and harvesting, will but tell us of the same, briefly and to the point, we shall indeed be able to put forward more reliable information as to the present position of Rubber-growing in Ceylon. The importance of the industry as one of the few products, for which there is an ever-growing demand, cannot be over-estimated.

THE CULTIVATION OF RUBBER IN CEYLON.

Kandy, Feb. 2.

DEAR SIR,—It is much to be desired that we should hear more about rubber and its cultivation from all who have information to impart, such as those experimenting in Ceylon and those who are directors of such establishments as the Peradeniya Botanical Gardens. It would indeed be a very appropriate time for Mr. Willis to strike his first note.

Some time ago attention was called in your columns to Mr. Rowland W. Cater's communication to *Chamber's Journal* on *castilloa* rubber and I see in the *Standard* of 29th January an interesting article upon "The Rubber Industry" commencing with the recent discovery of the Germans in their Cameroon possessions, of a prolific rubber yielding tree *Kickxia Africana*. It is said that the value of the export from Lagos was £324 6s 4d in 1894 and *£269,893* in 1895 all from this *Kickxia Africana*. In the *Standard* reference is made to efforts of Indian and Ceylon Governments and Ceylon planters to ascertain if the cultivation of rubber can be made profitable and speaks of the experiments of Ceylon planters not being remarkably successful, though finest varieties were introduced, and it states that "it is not uncommon still to hear of coffee planters in Ceylon and others in India laying out their estates in rubber!"

I do not think the introduction of the best varieties was on a large enough scale or has had sufficient time for very complete proof of success over an area of large extent.

The advantage of cultivation in respect to best varieties, accessibility of cheap labour, purity, and careful preparation as opposed to collecting in primeval forests—under disadvantages, that involve destruction of the trees, and after mixing with foreign matter and at much cost,—may be so great as to justify more attention to the matter than has hitherto been given here.

Mr. Cater's article "Out with the Indian Rubber Gatherers" is valuable for information of various sorts; but when he gives the figure of estimate of a plantation of *castilloa elastica* at Nicaragua with its results in 8 years it makes one wonder whether we have not neglected our opportunities in Ceylon. Having taken his selling basis on 2s a lb. only, calculating his trees planted 15 feet apart, included the premium of 3d per tree paid by the Government, wages of tapping at over 1s 3d per diem, he brings the following result of a 500 acre clearing at Nicaragua:—

	£
Cost of 500 acres of land at 5s p. acre ..	125
Survey and procuring titles thereto ..	100
Clearing land for planting ..	.. 1,000
Collecting seed and planting..	.. 500
Eight yearly weedings at £200 each	.. 1,600
Extras, implements, &c., &c.	.. 300
	£3,625
Interest on £3,625 eight years at 5 per cent p. acre	.. 1,450
Planters expenses, cost of living &c., per eight year at £200 per annum	.. 1,600
Cost of gathering the 8th years crop	.. 1,500
	£8,175

But his estimate of profit per acre at the 8th year is as follows:—

Dr.

	£	s.	d.
Cost of cultivation eight years 193 trees p. acre ..	.. 7	4	9
Cost of tapping or harvesting	.. 3	0	0
Balance of profit ..	.. 88	13	6
	£98	18	3

Cr.

	£	s.	d.
Government premium ..	.. 2	8	3
Yield 965 lb. per tree at 2s	.. 96	10	0
	£98	18	3

So that on 500 acres the profit would be £44.337·10.
If this is not satisfactory—go on to the next—the 9th year.

£	£
200 for weeding	Value of crop in 9th year 50,000.
1,500 for harvesting	
500 for planting	
180 for interest	
47,620 profit	
50,000	Profit would be £47,620.

His report of yield of the *castilloa elastica* in Nicaragua is interesting in view of the late Dr. Trimen's somewhat adverse report on the yield in Ceylon.

The trees at Wiharagama, Matale, seeded very freely and it is much to be regretted that on no proper scale has experiment been made with this variety.

J. M.

THE COCAINE HABIT.

The increase of inebrity from the use of cocaine is the theme of an article in the *British Medical Journal*. The article points out that the greatest number of victims is to be found among society women and among women who have adopted literature as a profession; and there is no doubt that a considerable proportion of cocainists have fallen under the dominion of the drug from a desire to stimulate their powers of imagination. Others have acquired that habit quite innocently from taking coca wines fortified with salts of the alkaloid in solution. It is stated that at Manchester, Kentucky, the cocaine habit has recently assumed the proportions of a veritable epidemic, and that thousands of people are suffering from it. The evil commenced with a local druggist, who advertised a popular remedy for catarrh, which was found on investigation to be a mixture of menthol and cocaine. There was a sudden demand for it, and it was taken to such an extent that many of the victims had to be accommodated in the public lunatic asylum. The symptoms experienced by the victims of the cocaine habit are illusions of sight and hearing, neuro-muscular irritability, and localised anæsthesia. After a time insomnia supervenes, and the patient displays a curious hesitancy and an inability to arrive at a decision on even the most trivial matter. In Paris the use of the hypodermic syringe both for the administration of cocaine and morphine is extremely common, and there are establishments to which ladies of fashion resort periodically in order to have the accustomed stimulant administered. According to the authority we have quoted coca wines made from cocaine and cocaine lozenges and tablets should be supplied with the utmost caution.—*H. & C. Mail.*

PLANTING IN NORTH BORNEO IN 1896.

(*B.N. Borneo Herald*, Jan. 16.)

Cultivation (SANDAKAN DISTRICT.)—At the Byte Estate about 160 acres are under coffee. Crop for 1896 piculs 532 against 300 during 1895. During the year the B.N.B. Development Corporation extended their coffee planting by 130 acres. They also sold 200 acres to Col. Molloy of which 50 acres have been planted with coffee and 10 acres with coconuts. A Chinaman who has bought land at the Byte has also planted about 30 acres with gambier. Kabeli estate (Coffee).—70 acres. Crop for 1896 piculs 102 against piculs 40-50 for 1895. About 25 acres more has been planted with coffee during the past year. Loong Piasow Syndicate's estate (Coffee)—70 acres. Crop for 1896 piculs 52 73, first bearing.

COCONUTS.—A considerable number have been planted at both Byte and Kabeli estates during the past year. The three year coconuts at the Byte are now in bearing.

MANILA HEMP.—Practically nothing has been done at the above estates with this during the past year, on account of want of skilled workmen. Under this head however, must be noted the 300 acres now being cleared and planted on behalf of the Dawson Syndicate, Glasgow. Despite troublesome or dishonest Chinese contractors, and the usual coolie troubles a large area has been cleared and burned, and the plantation is looking good enough to satisfy the most exigeant speculators.

TOBACCO.—As regards the tobacco estates the news from Lahat Datu is very good, there being a large crop and of good quality. On Batu Putih and Bilit the average is 4 piculs. Koyah and Lamag shew a higher production.

KUDAT DISTRICT.—The prosperity of the different cultivations in the Kudat District becomes more and more marked.

THE TOBACCO crops have been uniformly heavy and good in quality and search for more tobacco land by companies new to the district is being carried on with energy and success.

COFFEE is receiving attention by the Chinese Hakka settlers, many small acreages having been taken up and planted to the North of Kudat town while the plantations under European management have done well. The areas under cultivation have been extended and new land selected, and it is believed that coffee has become a permanent item of export. The soil is proved to be eminently suited for this cultivation, and there is abundant room for additional ventures.

COCONUT, LIMES AND ORANGES have yielded good crops and coconuts especially are being largely planted.

(Other Estates) COFFEE.—In reviewing coffee for the past year the only matter to regret is that operations have not been more extended. This is certainly not owing to lack of confidence of those engaged in coffee but simply the result of limited means at disposal and difficulty of getting outside capital. The new plantings for the year probably do not exceed 3 to 400 acres all told. We should be glad to see our local estates formulate systematic records of their crops, as from personal observation we are convinced that such figures could be shewn as would astonish outsiders.

COCONUTS.—New plantings are not in bearing with the exception of some of the 3 year variety on the Byte Estate. The avidity with which the coconut consignments from Cagayan Sooloo are bought up by our Chinese traders for manufacture of copra, and promises a good local market. The total as planted by Europeans in Sandakan neighbourhood is probably not far short of 800 acres.

TIMBER.—In the earlier part of the year the Hongkong trade was very encouraging to shippers and led to an extra regular steamer being put on the run. Unfortunately the last quarter shewed stagnation and collapse in prices. The moral is that shippers must not confine themselves to one market. The eagerly looked for era of "the opening up of China" has not yet dawned although we have the preliminary symptoms. There can however be no question as to the opportunity offered for Borneo timber when that does occur.

COFFEE-PLANTING IN NEW HEBRIDES.—We have had a call today from a Jamaica-born Scotsman—for Mr. Girvin's name clearly indicates an Ayrshire origin from Girvan—who has been for three years planting coffee in the New Hebrides, but who is now on his way to Europe with a view eventually to settling down in British Central Africa. Mr. Girvin reports about 2,000 acres of coffee planted in the New Hebrides, chiefly owned by one French and one Anglo-Australian Company; but the chief difficulty is labour, the islanders being very unwilling to do much work.

THE MAZAWATTE TEA COMPANY.

The first general meeting of Mazawatte Tea Company, Limited, was held on Friday, at the Cannon-street Hotel. Mr. John Lane Densham (one of the managing directors) presided.—The Chairman, in moving the adoption of the report, expressed his great pleasure at seeing so large a gathering. The first thing he should like to mention was the pleasing duty the directors had in reporting the continued progress of the business. The expansion of the trade had been evidenced in all parts of the United Kingdom. Their tea was not only drunk in every part of Great Britain and Ireland, bnt he might say it was taken from Norway and Sweden to South Africa and to Australia and West Indies. That year they had been able to pay £15,000 to the vendors, at the rate of 5 per cent on the capital np to some time in July. They had also been to wipe out all expenses for extra advertising. Tea was taken more in agricultural districts than in other places. He looked forward to a very profitable year.—Mr. B. Densham (the other managing director) seconded the report.—Mr. Vickery (a shareholder) suggested that as they were in such a flourishing condition they should send £200 to the Lord Mayor for the Indian Famine Fund. (Hear, hear.) He thought they could afford to be generous. The Chairman mentionod that, owing to there having been a collection in the tea trade, this qnestion had been considered, and it was thought that it would not be a right thing for a company so snbscribe. He and his brother had sent a cheqne privately from their own pockets, but he would oppose a company like that giving a donation, no matter how good the object. He felt very strongly on the subject.—Mr. Vickery intimated his intention of moving a resolution on the subject, but it seemed to be the general wish of the meeting that he should not do so, and he resumed his seat.—On the motion of Mr. Vane, seconded by Mr. Duke Dyke, it was agreed that a dividend on the prefcrence shares at the rate of £5 per cent. per annnm, and a dividend upon the ordinary shares at the rate of £8 per cent. per annum for the half-year euded December 21 last, be declared. —Other business was transacted, and after a vote of thanks to the chairman the meeting terminated.

NEW COMPANIES REGISTERED.

CEYLON PROPRIETARY TEA ESTATES COMPANY LIMITED.

Registered January 20, by Murray, Hitchins, Stirling, and Murray, 11, Birchin-lane, E.C., with a capital of £160,000 in £1 shares. Object, to purchase, take on lease, hire, or otherwise acquire any tea or other estates or lands or hereditaments of any kind in Ceylon or elsewhere, and any machinery, works, stock, and plant, and real or personal, immoveable or moveable estate or property of any kind and wheresoever situate, including concessions or easements of any kind; to hold, use, cultivate, work, manage improve, carry on, and develop the undertaking, lands, and real and personal estate, or property and assets of any kind of the company, or any part thereof; to plant, grow, produce, and deal in tea, coffee, cinchona, cocoa, cardamoms, and other plants, trees, and natural products of any kind in Ceylon or elsewhere; to work mines or quarries and to find, win, get, work, crush, smelt mannfacturer, and deal with ores, metals, minerals, oils, precious stones, &c. The signatories are :—

	Shares.
H. K. Rutherford, 21, Mincing-lane, E.C.	.. 1
R. A. Cameron, 41, Eastcheap, E.C.	.. 1
W. Johnson, Bart., 21, Mincing-lane, E.C.	.. 1
D. Reid, Shootfield, Sevenoaks	.. 1
H. Tod, 21, Mincing-lane, E.C.	.. 1
D. R. Smith, 41, Eastcheap, E.C.	.. 1
G. T. White, 31, Fenchurch-street, E.C.	.. 1

The directors are G. A. Talbot, R. A. Cameron, H. K. Rutherford, and F. H. Wiggin. Qnalification, £250. Remuneration as fixed by the company Registered office: 21, Mincing-lane, E.C.

CENTRAL PROVINCE CEYLON TEA COMPANY, LIMITED.

Registered January 20, by Budd & Co., 24, Austin-friars, E.C., with a capital of £100,000 in £10 shares. Object, to adopt and carry into effect four agreements made respectively between H. P. Powell, S. R. Pryor, and F. M. Mackwood, and the Company; with H. E. Millar and the Company; with E. M. Smith and the Company; and with T. M. Mackwood; and to establish and maintain any mills, factories, or works, or any interest therein, and in particular tea, coffee, and cocoa factories for treating any produce of Ceylon or the East Indies, or any other part of the world; for manufacturing and dealing with the same; as merchants, storekeepers, planters, commission or other agents, mannfacturers, shipowners, carriers, warehousemen, wharfingers, underwriters, contractors, and engineers; to acquire and turn to account any oil wells; as miners and smelters, &c. The signatories are :—

	Shares.
H. P. Powell, 10, Herbert-crescent, S. W.	.. 1
A. G. Kendall, 26, Palace-terrace, W.	.. 1
F. W. Selfe, 6, Trinity-road, Wimbledon	.. 1
C. B. Hervey, 88, Cazenove-road, Stoke Newington	1
T. L. Franck, Tecoma, Acton, W.	.. 1
S. B. Topham, 94, Constantine-road, Hampstead	.. 1
F. O'Connor, Stoke Villa, Forest-gate, E.	.. 1

The directors are H. P Powell, S. R. Pryor, and F. M. Mackwood. Qualification, £500. Registered office: 148, Leadenhall-street, E.C.—*H. & C. Mail*, Febrnary 5.

THE DUTY ON TEA AND WAREHOUSE ABUSES.

To the Editor of *The Home and Colonial Mail.*

SIR,—I understand the Indian Tea Association of Calcutta have passed a resolution in favour of the reduction or abolition of the import duty on tea, and have forwarded an earnest appeal to the Association in London to use their best efforts towards the attainment of this end. It is to be hoped the council of our Association may give the matter that independent and through investigation and consideration to which it is entitled, and act for the best interests of the producer and consumer.

Let us consider this important question in some of its bearings. It is sometimes urged that the duty proporly acts as a premium on *quality* and that its abolition or further reduction would unduly encourage the prodnction of common and low-class teas. But the changes nnder discussion could never unfairly discourage the manufacture of the fine teas, because it never can be otherwise than for the benefit of gardens, with the soil and conditions favourable to their production, to aim at the highest quality. On the other hand, abolition or reduction can be no more than fair to gardens wanting in the natural advantages for the growth of prime quality teas, which all over India must always constitute the vast majority. The duty undoubtedly favours the minority with nature on the side of quality, and unfairly handicaps the great majority of concerns only capable, with the utmost skill and care, of turning out teas exquisite make, it may be, but withal of medium quality. This is beyond dispute. To pnt it plainly, "stand-out" and higd-class teas can afford to be watered by duty, so to speak, to an extent that common and medium teas cannot. This is demonstrated by a very simple formula as given below.

Doubtless, abolition or material reduction of duty would unjustly favour the poorer teas from China or Japan. This may not be viewed with apprehension just at present. It would, however, if the China trade should rovive, in which case the equitable adjustment (though probably more than need be looked for under onr free trade policy) would be continuance of duty in case of repeal, or otherwise differential duty on non-British-grown imports, which is required to compensate the imperial producer to the extent he is handicapped against free silver countries through the operation of existing Indian exchange and currency regulations.

It would seem no more than fair to reduce the tea duty to 2d per lb. as in the case of coffee. This could not fail to prove a boon to the great bulk of the population of these isles, and lead to an increase of consumption, so that the loss to the Exchequer would not be great. It is sometimes asserted that consumption has already reached its limit, but if we reflect what the consumption of an ordinary household with servants (but exclusive of guests) is—probably considerably over double the average consumption per head of the population, making full allowance for the coffee and other beverages used—it would seem reasonable to calculate that if tea were cheaper the consumption per head would soon rise to, or even exceed, that of the Australian colonies at present.

As the duty affects the consumer, the case may be stated, not to go to extremes, as follows:—For *quality* tea 1s 8d, plus duty 4d, equals 2s per lb; on the other hand, for common tea 8d, plus duty 4d, equals 1s per lb. In the former case the purchaser has to pay one-sixth of his money, for which he receives no value in tea in the latter one-third of his money goes in that way. Here I, of course, take no account of the profits of the dealer, middleman, or grocer, which may likewise weigh proportionately against the lower-priced teas. It is also well-known that in "stand-out" teas 1d per lb of extra quality often adds 4d to 6d per lb. to the price at public auction. This while in no way benefits the great bulk of producers, is doubtless to some extent fostered by the duty. It may be contended, therefore, that an *advalorem* duty would be fairest, but its collection would doubtless prove much less convenient for all concerned. In the interest of the great body of producers it is to be hoped, however, that any further material er permanent fall in the retail price of tea is to come from reduction of duty, or it may be of profits on this side.

The strongest objection urged against abolition is the withdrawal of the customs' supervision, and the consequent risk of adulteration and the flooding of the markets with spurious teas. But there is not the same temptation to do this with tea at its present price, as there would have been twenty-five years ago; and many large dealers are of opinion that the Adulteration Acts in force alone afford ample security against adulteration.

But one thing about which there is absolute certainty is, that any advantage, however great from the customs' supervision, is more than counterbalanced by the injury to the tea industry from the objectionable treatment the teas receive in the bonded warehouses. This need not be enlarged upon here, as the subject has formerly been touched upon in these columns, and may, it is to be hoped, be dealt with more fully on some future occasion. All that need be remarked is, that if teas were exposed to the moist atmosphere in bulking, and, worse than this, left unsoldered by the manufacturer, as is the practice in the warehouses, they would be absolutely ruined, and we cannot with a clean conscience go in for the conquest of new markets boasting of machine manipulation throughout, and entire freedom from objectionable handling, so long as the teas are trampled into the chests by the dock labourer on refilling.

For Imperial considerations, however, abolition would seem a mistake. The duty, though falling upon nearly all, and in some respects, as has been shown, more unfairly than it might, is but little felt. It is almost the only tax paid by abstainers and non-smokers, and it affords Government a means of increasing the revenue in any emergency, without causing dissatisfaction, as was done during the Crimean war. The objection to further reduction is that the net revenue would be unsatisfactory, as the cost of collection would remain the same; but why should this be urged in the case of tea more than coffee, cocoa, or chocolate?

As abolition does not seem desirable on patriotic grounds, and there may not be great hope of material reduction of duty, and whether or not it be decided to agitate for either, justice to the producer and also the consumer demands, without delay, the most vigorous and persistent efforts on the part of the Association, until the desired reforms be secured in regard to the treatment of our teas in the bonded warehouses, which no one can deny is a discredit as well as an injustice to the British tea industry.

These warehouse abuses have doubtless grown up with and become linked to the Customs' supervision and regulations, and are to some extent due to the London representatives of the industry not having insisted upon certain details that ought to be carried out at the factories being attended to there. But the sooner reforms in those directions are pushed the better for the great body of producers, as the warehouse abuses may be continued (if strenuous and sustained efforts be not made to remove them) even after the repeal of duty and the withdrawal of the Customs' control.—I am, sir, yours, &c., PLANTER.

Feb. 3rd 1897.—*H. and C. Mail*, Feb 5.

THE RONDURA VALLEY TEA COMPANY OF CEYLON, LIMITED.

The first General Meeting of this Company was held at the registered office of the Company, No. 6, Prince street, Fort, Colombo, today when Messrs. A. E Scovell, F. W. Bois and Alfred Scovell were reappointed Directors.

An Extraordinary General Meeting was afterwards held when the following resolutions were carried unanimously.

(1) To consider an offer made by the Yatiyantota Ceylon Tea Company, Limited, to purchase the Company's estates, called and known as Rondura, Broadlands, Yahainde, and Florence, as from 1st January, 1897, the price to be paid, after completion at the expense of the Rondura Valley Tea Company of Ceylon, Limited, of the factory and road, to be £33,230, payable as to £30,000 by the issue to the Rondura Valley Tea Company of Ceylon Limited, or its nominees, of 2,000 ordinary £10 shares of the Yatiyantota Ceylon Tea Company, Limited, at an issue price of £15 per share, the remaining £3,230 being paid in cash at current rate of exchange on date of transfer, for telegraphic remitances from London to Colombo.

That C "that the Rondura Valley Tea Company of eylon, Limited be wound up voluntarily." (Should such resolution be passed by the requisite majority, it will be submitted for confirmation at a second Extraordinary Meeting, which will duly convened." By order of the Board of Directors J. M. ROBERTSON & Co., Agents and Secretaries.

VARIOUS PLANTING NOTES.

ROYAL GARDENS, KEW.—Bulletin of miscellaneous information, for January: Contents.—List of Kew Publications, 1841-1895. Miscellaneous Notes. —Mr. W. Thorpe.—Visitors during 1896.—Botanical Magazine.—Journal of Sir Joseph Banks.—Australian Myrmecophilous Plants.

IPECACUANHA has been recommended by Father Banlez as a remedy for plague. Dr. Cantlie, in a paper on plague re-published by the Government of India, also recommends an emetic in the early stages of the disease.—*M. Mail*, Feb. 24.

DEAFNESS. An essay describing a really genuine Cure for Deafness, Ringing in Ears, &c., no matter how severe or long-standing, will be sent post free.—Artificial Eardrums and similar appliances entirely superseded. Address THOMAS KEMPE, VICTORIA CHAMBERS, 19, SOUTHAMPTON BUILDINGS, HOLBORN, LONDON.

THE MANURING OF TEA ESTATES: IN CONCLUSION.

The fourth, and final, batch of letters,—from the 36th to the 61st (see pages 619-624)—on the manuring of tea estates, remains to be reviewed in conclusion of the series. The letters are full of information and suggestion, and represent almost every part of the island in which tea is a leading product. Thus, in the first six of them, published on the 5th inst., we have "M." from a "High District," who tells us in a few words that manuring is getting to be general in the island, that about 15 to 20 per cent of the estates use artificial manures, as special facilities are necessary for securing bulky manure; that 2-3rds Castor to 1-3rd Bones is the usual proportion; and that, while he fears a good deal of soil must be washed away by manuring steep slopes, he thinks manuring increases the yield by 150 to 200 lb. per acre. Now, should it not be the endeavour of the careful husbandman, by terracing or otherwise, to reduce risk of the wash to a minimum, since it is the steep slopes that generally most need renewal of soil? "Kelani Valley" confirms "M"'s experience, that more is being done with Castor and Bones mixed in the mills, than with Bulky Manure; that though he commenced the use of artificial manures with misgiving, he is now a staunch advocate of manuring, as it improves the yield and also the appearance of the bushes; but he thinks the quantity of the tea suffers somewhat, and he fears that the water supply is injuriously affected, leading to the greater prevalence of typhoid. This is certainly a matter which demands attention, and if the fear is justified, special care should be taken to protect the water. The opinion that artificial manuring will need to be continued, at intervals, say of three years is shared by many planters, since otherwise the bush deteriorates. But why, if the treatment pays, should it ever be discontined?

"*Æquus in Arduis*," from an "old and medium elevation district," reports that manuring is very general in it, though not throughout the country; while at very high elevations, where transport is difficult, scarcely any manure is applied. The usual mixture is Castor and Bones, though Fish and Nitrates are not unknown. As regards good results, and the necessity of continuing manures when once begun, he agrees with the previous writer; while to the drawdack of wash he adds the cost of weeding—a sign, surely, of enrichment of soil. "Manager" from West Matale disclaims experience for a positive opinion, as he has just begun manuring; but so far the results are highly satisfactory, the fields manured with bulk having yielded 950 lb. per acre and with artifical, mixed in Colombo, 1,050 lb. Nor has the price of the tea fallen. "T. Koko" from Wattegame has a similar tale to tell, of yield being doubled and more, by manuring, especially on old coffee land, though he suggests a careful mixture of artifical with bulk with plenty of soil, and he strongly deprecates the burying of prunings "as no tree feeds on its own refuse." We should wish to know how far this opinion is supported by scientific authority and practical experience. On what do forests thrive, but the vegetable mould formed of their own "refuse"—natural, taking the place of artificial, manuring? And are not coconut husks generally regarded as among the best manure for coconut trees? "L. A. W." pleads lack of experience; but he does not doubt the beneficial effects of manures, and fears their application is too long delayed, especially in the lowcountry, while artificial alone can do little for worn-out estates.

In our issue of the 9th inst. "Z," from Matale reports very good results from the annual application for the last six years of cattle manure on 30 to 50 acres. It is not very clear whether the same field is meant throughout? If so, we suppose the reason for the annual application is that the land is worn out. "A Northern Planter," from Kandy, expresses confidence in manures, whether bulk or artificial, and observes an extension of manuring in the older districts with good results—550 to 600 lb. being harvested from systematically manured fields, against 300 to 350 lb. from unmanured. Last year adverse exchange restricted manuring; and it is doubted whether in a forcing climate, a very high jât will respond as readily as a hybrid. From Udapussellawa, "Querist" can say nothing from personal experience, but he has been observant of his neighbour's operations, and he would like to see the experience of a period, say four years, recorded. So far, he learns quantity is decidedly increased without sacrificing quality; but he expresses hesitation about adopting artificial manuring "after the deadly effect that Matale manures had on our coffee, but particularly salts of sorts." Now, is there any real proof that our Coffee suffered in the manner indicated? If such disastrous results can be verified and localized, an expert should certainly be consulted regarding similar results with Tea. The tendency of W. J. G.'s verdict is against the manuring of vigorous Tea, giving a satisfactory yield; but in the old and worn-out districts, the benefit derived has been most marked; and yet again, he fears quality suffers from the rapid production of leaf. To manure vigorous plants with artificial manure, he considers tantamount to killing the goose that lays the golden egg.

On the 10th we published four letters—from "I," testifying to the beneficial effects and splendid results obtained by the application of bulky manure, wherever, available, expressing his conviction that manuring must spread, especially in the older districts and that no harm could come of regular applications at fair intervals. "Ouvah" from Badulla can speak, happily, only of the application of well-rooted bulky manure, with most satisfactory results as regards quantity and health of bushes; but he is unable to say anything about quality, and doubts if "artificial" can be applied regularly and then stopped without evil consequences. In a private letter, our correspondent, a planter of large experience and holding a very responsible position, fears that manuring is being done greatly in the dark, and thinks that an Agricultural Chemist might do a great deal of good to the country. Meanwhile, he warmly commends our efforts to collect information and focus results for the benefit of the planting community, and also we may add for the guidance and opinion of experts. "Senex" from Kotagala supports the generally beneficial results we have already noted, but thinks some care should be taken lest large doses of artifical manure, should tell on the flavour of the tea as the natural oils or scents of plants are known to be affected by cultivation; and he instances the wild carrot or celery. This is therefore peculiarly a matter for investigation by an expert, and strengthens our position in favour of an Agricultural Chemist. "B" from the Southern Province gives interesting figures which attest the excellent

increase of yield obtained by manuring, while the bushes and the wood stand out well.

In our issue of the 11th "G. T. R." from Udapussellawa strongly favours Cattle Manure as the best, but in its absence artificial has been applied with good results, and prunings were buried at the same time, and he, counsels the practice ! The interesting question he propounds is whether the quantity of artificial may not of necessity have to be increased after repeated applications, but will not that depend greatly on the soil ? If the soil be worn-out and thin, it would be undoubted gain, to obtain remunerative returns from it, albeit only for a time. "J. B. C." from Kelani Valley supports the verdict in favour of manures on all grounds, and regrets that shortness of labour prevents larger applications. "C. H. B." from Udapussallawa, is also an advocate of manuring, but judiciously, and he especially deprecates over-stimulating. The older and more worn spots show more appreciable results. "S." from Talawakele takes a rather different view, and, pleading the shortness of life, would carry on liberal cultivation everywhere and on all soils, thus securing from 200 to 300 lb. per acre more than at present. This aspiration is controlled by the lack of labour, and, may we add, by the fear of over-production; but the problem he sets forth is one worthy of attention, whether we are not justified in forcing out of the bushes in 30 or 40 years what they will take 55 to 60 years to yield naturally. His advice as to caution, however, will receive more general support, as also the warning against cutting the larger roots. He scoffs at the notion of flavour being affected by a rich soil; but is there not a difference between a naturally rich soil and one artificially stimulated?

The fifty-ninth letter, and a very suggestive one it is, appeared on Saturday last from "C. T." from Ambagamuwa. He strongly advocates bulk, quoting results, and is rather suspicious of artificial manures, which however, is a necessity in most cases. Finally, we come to the 60th and 61st letters which close the series and are by no means the least important. Indeed the "Homo," who signs with a very proper Latin monition, and to whom we owe an apology for not sending him a circular in the first instance, is almost the only one who favours us with tabulated results of experiments carried on, evidently after a fashion that will delight the heart of Mr. John Hughes among others. "Homo" very properly reminds us of the many factors,—some of them apt to be overlooked—that ought to be taken into account, in cultivation; but he and "J. J." agree —like so many more—in giving the preference to "Castor cake and Bones" as, on the whole, yielding the best results.

In concluding this review we owe it to our friends to thank them very heartily for their contributions towards the solution of a very interesting and important problem, with which is intimately wound up the prosperity of the Island. We have another Circular "in pickle" !—indeed it is already in circulation and most valuable information on several points connected with tea cultivation and preparation has already reached us from many leading members of the planting community.

PRODUCE AND PLANTING.

INDIAN AND CEYLON TEAS IN THE UNITED STATES.—We referred last week to the increasing popularity of Indian and Ceylon teas in the United States. A prominent Philadelphia distributor who declined to handle these teas at one time has recently published the following: "During the year 1896 there has been a most marvellous growth in the consumption and sale of Ceylon and Indian teas, principally, however, in packages under the proprietary brands and under the stimulus of proprietary enterprise. At the same time the sales of bulk India and Ceylon teas have largely increased. This is one of the strongest proofs that can be given of the value of judicious and well-continued advertising, for had not these teas been advertised as well as they have been during the last year or so the sales probably would have been of an infinitesimal character. Now there is no question in my mind whatever but that the Ceylon teas and the Assam teas have come to stay. Not only are the people buying the teas, but they seem pleased with their aroma, their strength and colour, and their greatly nourishing qualities. In a blend with other teas they are productive of the most marvellous results in producing body, character, and good drawing qualities. The grocer of '97 who does not use to a greater or less extent in his business these machine-made, carefully prepared teas will surely drift to the rear. If the planters' associations keep up their fight for Ceylon and Indian teas they are bound to gain a strong foothold in the United States."

WHITE TEA.—The British Consul at Meshed (Persia) has a note in a recent report on this subject. He states that "white tea" is really nothing but common Pekoe, with a sprinkling of the unfermented sun-dried tips thrown in. Much care is required in preparing these silver tips, and a pound of them would cost perhaps 15 rupees. But even a sprinkling of of them is sufficient to impart a very delicate perfume to any tea, and with this the Persians have been greatly taken. The brand sold is poor stuff, with only a slight odour, but the upper classes now use hardly any other, especially during ceremonial visits.

"BEAUTIFUL" CEYLON AND ITS TEA INDUSTRY.—In his lecture before the Society of Arts, referred to elsewhere, Sir Charles Dilke paid a high tribute to the planting enterprise of Ceylon, remarking that Ceylon, which was one of the most beautiful and one of the most interesting portion of the earth's surface, had more than recovered her prosperity through the brilliant enterprise with which the settlers had turned to the planting of a fine tea.

A COSTLY QUARREL.—There is a nice little struggle now in progress in New York between the Sugar Trust and Arbuckle Brothers, a very rich firm of coffee roasters. The New York correspondent of the *Grocer* describes the way it came about. He says: "The Arbuckles bought of the inventor a machine which automatically weighs sugar and puts it up into packages, which sugar the Arbuckless sold with their patent glazed coffee, put up in sealed packages, and sold under a proprietary label. For this machine they paid £20,000. They offered to sell it to the Sugar Trust for £50,000, but they refused to purchase. Then the Arbuckles decided to build a refinery, and make themselves independent of foreign or domestic refiners of sugar. In retaliation, parties, in the interest of the Trust, bought out the Woolson Coffee and Spice Mills of Toledo, Ohio, incorporated in 1882 with a capital of £20,000. This company made enormous profits, selling their shares at a price reported at £230. It is said the controlling interest cost the Sugar Trust's agents £252,000. The Arbuckles managed to buy in a secret manner sixty shares of stock (for which, it is said, £20,000 was paid), which move was to give them a position to demand all the knowledge and such rights as stockholders are entitled to receive. Some years ago the Arbuckles adopted a recipe of their mother's for keeping the flavour of coffee, which calls for a coating of the bean with a substance of an albuminous character, giving the coffee a glaze and practically hermetically sealing the bean. The sale increased enormously, and their brands obtained a foothold that no one could dislodge. Some idea of the magnitude of their business may be

gained from the fact that they imported in 1896 a total of 757,091 bags of Brazil coffee alone, or nearly 100,000,000 lb. It is claimed that they roast and distribute over 2,000 bags per day. This has been an enormously profitable business. Thirty years ago the South and West used only green coffee, and it took years to overcome the prejudice which consumers had towards coffee sold ready for use. They believed coffee should be roasted at home, and only as required, if its full aroma was to be retained The Arbuckles' device insured the aroma, and soon the bulk of the trade. There are now three great roasting concerns. As soon as the Woolson Company changed hands the price of their coffee was reduced, which cut the Arbuckles net. Cut has followed cut, until 2½ cents per pound has been taken off. The fight is between giants, but Napoleon said, 'Heaven is on the side of the heaviest artillery.' The probable outcome will be the formation of a coffee-roasting trust and a compromise and treaty with the Sugar Trust, whereby both interests will go on peacefully and profitably. The Sugar Trust forced the fight from the date of the inception of the Arbuckles' plan for an independent refinery. At present the war is vigorous and costly, and hence is likely to be short-lived."—*H. & C. Mail*, Feb. 5.

TOBACCO—AND CEYLON PLANTERS.

How is it that while the natives—the Tamils especially—in so many districts, Negombo, Chilaw, Jaffna, Trincomalee, Uva and, we suppose, around Dumbara continue to cultivate tobacco profitably, the European planter should have cast it so much on one side? For the coarse native growth, a price equal to 25 cents each big leaf is, we believe, readily paid in the bazaars; and even, therefore, for the supply of the local demand, one would suppose plantation fields of tobacco would, in some places, prove profitable. With the object of getting the opinions on this point of the gentlemen who have had actual experience in our midst, of growing tobacco, we sent some notes of enquiry and the results we are now able to lay before our readers, in the following interesting communications. These were provoked, in the first place by the contributions of an expert, writing from Southern India in our columns some weeks back. His last letter we referred to local authorities and one of these challenged the expert's statement that Ceylon could produce "a very pure and high-class leaf," insisting instead that high-class leaf for cigars could not be produced here. Only on one estate was this ever done in Ceylon, we are assured. Another gentleman with some experience thought "Expert" wrote to the point and that he touched the key of the situation in the following:—

All that is necessary to ensure success is a thorough knowledge of growing and of manufacturing, coupled with businesslike management and the requisite capital.

This "and a railway to Jaffna" he thinks should ensure success to tobacco-growing. Does that mean that Jaffna land would be chosen by European capitalists—or that Jaffna men would be employed as cultivators? Here is how another resident writes:—

I am sorry that I can give you no information with reference to tobacco cultivation. There must surely be some good reason for the cultivation being abandoned by the Ceylon Tobacco Company when they had an experienced Sumatra Tobacco Planter to start and supervise the work. Then if, as was stated at the time, Messrs. Vollar and Gwatkin made such a good thing out of their tobacco, grown near Kandy, why did they not continue its cultivation? Why did Mr. Ingleton fail to make both the cultivation of tobacco and manufacture of cigars pay? ————should be able to give you some reliable information, also——and ————who, I remember, was Superintendent of the Tobacco Company when the first crop of tobacco was secured. Where is the land to be got suitable for tobacco cultivation on any large scale? I know of none. I think a dry climate with a good North-East monsoon rainfall would suit it best, as that would dispense with watering and permit of the leaf maturing in dry weather. It has first however to be shown that tobacco can be profitably cultivated in Ceylon by Europeans; if that is once assured I think there would be no lack of men to try their fortune.

Here is the deliverance which Mr. Vollar himself kindly sends us:—

"I do not think the colony can do a big thing in cigar tobacco. There is no doubt we can *grow* first-rate cigar tobacco, but so far we have failed in the curing of the tobacco, and in the making of the cigars to have them mild enough—which is the thing that is wanted at home. There is no land available in the Central Province, and the soil in the Western is not suitable. Jaffna tobacco is too coarse and rank.

"If tobacco could be grown on the Eastern side and proper care taken in the curing and manufacture, it would, I think, pay well; but it's a very ticklish product to cure and so dependable on weather."

Another tobacco authority takes a rather different view, although in the main equally discouraging:—

"I fear good tobacco suitable for the manufacture of cigars for the European taste cannot be produced in Ceylon. It is true Messrs. Vollar and Ingleton grew some fine tobacco in Dumbara eight or ten years ago which took attention at home; but in no other district in Ceylon was ever afterwards such tobacco grown and it had a very fair trial in several other districts as I know only too intimately, but without success. We cannot produce leaf thin enough in texture for the manufacture of cigars and no one will look at ours at home or on the Continent."

There is nothing like having all possible views from different quarters and the next local authority we are going to quote, has entered so fully into the matter that his letter is a little essay in itself:—

You ask me "why tobacco and cigar making dont do in Ceylon." I could reply by telling you why they did not do; but it might get me into hot water, so instead of giving a direct reply I jot down a few notes which may be useful.

There can be no question that under the guidance of capable energetic men, with the necessary skilled experience, and of course backed by sufficient capital and *pluck* to stand a few failures, Ceylon could yet compete successfully in the tobacco markets, though the recent failure of the Tobacco Company would deter many from venturing in the revival.

Stress may be laid on two if not three facts:—1. Tobacco is a leaf product which, unlike tea, is more like a fruit, in its requiring specially favorable and seasonable weather for ripening, harvesting and handling. 2. That a very large labourforce is indispensable. 3. That freight *has* been a difficulty in the past, and I am not aware if that has been solved yet.

The opinion was expressed long ago that it was not a work for Europeans to engage in, and good reasons were given; but the same was said of coconuts! Nevertheless *no* work requires so much concentrated, constant, intelligent, individual, personal supervision. This may be a piling-up of adjectives, but it's a fact and the tobacco planter must be prepared to forego tennis, cricket, foot-

ball and "Mounted fut" during the busy season. You could not trust native overseers, as teamakers are—nor your field conductors. Every work must be done as much as possible under your own eye, or a *few hours* of neglect may cause ruin after months of careful forethought and attention.

Most of the Ceylon (*though not all*) grown tobacco has been too strong and coarse for the English market. More men (*and children*) smoke than ever, and smokers consume more than ever, and want a mild weed, or they would smoke their heads off!

The failure of a Ceylon planter in establishing a demand for Ceylon-made cigars, after prolonged perseverance, deserving a better fate, was owing to (1), Too tight rolling. (2), Leaf too strong and coarse. (3) liquoring down (4) and certain ingredients to improve flavour, his own taste being for "grip" with flavour. The writer has smoked thousands of his cheroots, but found the muster uneven, sometimes only one good box out of four, but that one *was good*! Ten or twelve years ago,—made a beautiful large "Nona" brand, but men grunted at the price which was most unfair, and beating down the price led inevitably to inferior products! 'Tis so with everything now-a-days. It is folly to talk of "cheapness," but fools are plentiful according to Carlyle. Good quality must be supported by good prices. Surely our Tea history proves this. It's waste of time to enlarge upon so palpable a fact, and yet it will take generations more to drive this into men's and women's minds. Most of the Indian fancy work of today is inferior to that of 20 years ago. Brass-ware has not half the weight in it. Cotton goods are coarser. Good linen is a scarce article now. Tools and cutlery are vastly inferior, and as for note paper, it is awful. The ink soaks through and one can only write on one side of a note-paper costing R1-25 per 5 quires. (That last gets over me, for you can buy capital note paper at home at 3¾d per 5 quires!) The housewife who is always beating down the tradesman does more harm than she imagines to future generations. Who is to blame for so much of the sweating that goes on in Europe? But *revenons à nos moutons*. Good cigars need good baccy grown from selected seed in good land, under favourable circumstances as regards soil (rich in potash and lime and friable) lay, elevation, rainfall, shelter from wind, and suitable aspect, with an ample labour force irregularly employed.

In reply to your query therefore I ask where in Ceylon can these be got? And having grown and cured your tobacco will tea and baccy ship better than tea and apples?

I have shipped several thousands of Ceylon cheroots and also took home some thousands and went to friends in the wholesale trade; but utter failure was the result. To compete with Indian cheroots, they wanted Punchi Nonas at R15 per 1,000 f-o.b.!! Put that in your pipe and smoke it if you can; it made me turn worse than any mal-de-mer! T. KOKO.

We shall now await with interest, the comments of our Indian tobacco expert on the above expressions of opinion by Ceylon planters.

THE CENTRAL PROVINCE CEYLON TEA COMPANY, LIMITED.

Regarding this Company whose registration we noticed in our last issue the prospectus states that it has been formed principally for the purpose of acquiring, working, and developing the Estates mentioned in the following Report by Mr. Mackwood:—

November 2nd, 1896.

Messrs. Cotesworth & Powell, London.

Dear Sirs,—I engaged Messrs. C. Spearman Armstrong and Thomas Smith (of Dolosbage) to go over and report to me in detail upon the following properties:—

Barnagalla and Dedugalla Estates in Dolosbagie district. Goonambil and Eriagastenne and ⅔ Raxawa in Pangwella district. Wayweltalawa in Ambagamuwa district, Berat in Dickoya district. Castlemilk (including an addition referred to in the prospectus) in Pusilawa district.

I have carefully checked their figures of area, estimates of crops, expenses and profits, and am able from my intimate knowledge of most of the estates, and general knowledge of the others, to confirm their estimates.

The area of the properties is as follows:—

1,545	acres	tea in full bearing.
83½	,,	,, in partial bearing.
110	,,	,, under 2 years' old.
140	,,	,, now being prepared for tea.
185	,,	,, cocoa in full bearing.
56½	,,	,, ,, in partial bearing.
1,620	,,	,, forest-Chena and other land, of which 590 acres are virgin jungle —80 acres planted with fuel trees; the greater part of the whole area will grow good tea.
3,740		

The estates are in good order, have substantial bungalows, sufficient coolie lines and fully equipped factories, with the exception of Goonambil, where a new factory is in course of erection.

The properties are easily accessible, being all (except one) within a few miles of railway stations, and having high roads passing through or near them. The one estate excepted is within four miles of a high road, and cost of transport from it to the seaport, Colombo, is as cheap as from the other estates.

The labour force on the estates is adequate, the coast advances out amounting to R20,995 as on the 1st July last.

The crops for the past season aggregated 721,826 lb. but of this amount 18,000 lb. from one small place is taken on the statement of the native owner; there were also 520 cwt. cocoa.

The crops for season 1st July, 1896 to 30th June, 1897, are estimated at 767,800 lb. tea.

The profits for this period are estimated as follows:—

			R.
Tea, 767,800 lb. to nett (6⅝d. per lb.)	..	..	348,688·00
Cocoa, 542 cwt. to nett (45/11 per cwt.)	..	..	20,596·00
		Total..	369,284·00
Less upkeep expenditure, tea and cocoa		R. 238,870·50	
Minus profit making outside tea ..	R. 14,880·00		
Minus profit making outside tea ..	4,800·00		
		19,680·00	
			219,190·50
		Nett Profit..	150,093·50

In addition to the above upkeep expenditure, the outlay on capital account for cost of factory, increased machinery, opening 140 acres new land and upkeep young tea is estimated at R56,792·00.

Messrs. Armstrong & Smith, worked their calculations on the basis of exchange of 1s 2½d per

Rupee, at which rate the profit for Season 1896—97 would equal £9,068 3s. I am, Dear Sirs, Yours faithfully, F. M. MACKWOOD.

The price to be paid by the Company has been fixed by the Vendors at £92,500, leaving £7,500 surplus capital.

The Vendors take payment in £16,500 of Preference Shares and £16,500 of Ordinary Shares, and the balance in cash.

The Company buys the Estates, other than the additional lands at Castlemilk, as from 30th June, 1896, and will pay interest on the purchase money at 5 per cent from that date. The Company will repay the owners with 5 per cent interest, the expenses already incurred on the crop beginning 1st July, 1896, including all sound coast advances, and will be entitled to all profits from that date.

The titles to the proposed addition to the Castlemilk property are now under examination. This property will, if acquired, be taken over as from the date of transfer, and if this purchase be not completed, the surplus capital will be increased by the sum proposed to be paid for its acquisition. The above estimated profit of £9068 shows nearly 10 per cent on the price at which the Company acquires the estates. The surplus capital, it may be hoped will be equally productive, as it will be mostly used in developing the present estates or in further purchases to extend the acreage, several of the estates being in districts where extensions will not be difficult. Estimating the surplus capital to earn 6 per cent, the total profit would exceed £9,500, which, after providing for the Preference Dividend, £3,000, would leave £6,500 available for the formation of a reserve or improvements and payments of dividend on the Ordinary Shares. There should also be some increase in profits as the young tea comes into bearing. Allowing £5 per acre on the 1,620 acres forest, Chena waste and lands planted with fuel trees as well as the 140 acres in preparation for planting, the cost of the 1,980 acres planted, equals £46 1s 2d per acre. Mr. Mackwood is willing to act as the Company's Agent in Colombo.

———

Messrs. Cotesworth & Powell have, for the commission on sales as previously charged and estimated for in the figures of the Report, agreed to provide management in their offices for a period of 10 years from the 30th June, 1896, and during this period neither the two members of that firm who are Directors, nor Mr. Mackwood while Ceylon Agent, will be entitled to claim any remuneration as Directors. The above estimate of profit is therefore free of further charge for management in London, unless the Company appoint more Directors. The only Directors of the Company at present are the two partners in the firm of Cotesworth & Powell, and Mr. Mackwood, who are the Vendors to the Company of the greater part of the properties proposed to be acquired and they have fixed the purchase price. Intending subscribers for shares are to be treated as having knowledge of these facts and as subscribing on that basis. The Vendors bear all the expenses of the formation of the Company up to the first allotment. Applications for both Preference and Ordinary Shares will be considered before applications for Preferred Shares only. Preference and Ordinary Shares will rank equally for voting purposes. The Articles of Association of the Company restrict the borrowing powers of the Directors, without the consent of a General Meeting, to the amount from time to time paid up or treated as paid up on the Shares for the time being in issue of the Company.

INDIAN PATENTS.

Applications in respect of the undermentioned inventions have been filed, under the provisions of the Inventions and Designs Act of 1883, during the week ending 6th February 1897 :—

Apparatus for cooling tea leaf.—No. 37 of 1897.—Nathan William Horatio Sharpe, engineer, of 26th Perth road, Stroud green, London, for an apparatus for cooling tea leaf to facilitate oxidation or fermentation, and for withering the same.

Improvements in the manufacture of black tea.—No 42 of 1897.—Samuel Cleland Davidson, mercant, of Sirocco engineering works, Belfast, Ireland, for improvements in the manufacture of black tea from the green tea leaf.

Improvements in appartus for withering or limping tea leaf.—No. 43 of 1897.—Samuel Cleland Davidson, merchant, of Sirocco engineering works, Belfast, Ireland, for improvements in apparatuc for withering or limping tea leaf in the course of its manuture into black tea.—*Indian and Eastern Engineer.*

THE COCCIDÆ OF CEYLON.*

Fiorinia Fioriniæ, *Targ. Tozz.* Adult male not observed.

Habitat on under surface of leaves of the camellia plant and the coconut palm. Punduloya (September). I have not yet foundthis insect upon tea, but its presence upon such a closely allied plant as the camellia makes it extremely probable that our staple product may be attacked by this pest. Its presence in large numbers upon coconut leaves must be injurious, the affected leaves turning a sickly yellow colour. The same insect is said to affect the Areca palm. The species is widely distributed, occurring in Europe, America, and Australia. But Mr. Green adds a note this very month :—

Since writing above—this species has turned up upon tea. I have found it firmly established upon a tea plant on an upcountry estate: and also upon Areca palms in the same district.—E. E. G., Feb. 1897. But in regard to identification of course the plates are of most value. Regarding them Mr. Green writes :—

"I very much regret that, owing to an unfortunate mistake between publisher and lithographers, the plates have been printed on smaller paper than the letter press. The difference was not discovered until too late to rectify the mistake. I find too that my publisher has followed the modern plan of issuing the part unstitched, which—however good it may be for the subsequent binding—is not a very convenient form for present use.

"I trust however that, in spite of these and other defects, the work may prove useful.

"I have previously explained that I have been unable to include in this first part the special chapters on Insecticides and General Preventive Measures. These will appear in Part II, upon which I am now at work.

"The book is to be completed, if possible, in four parts: but the number of species to be described is steadily increasing. Since my return to Ceylon I have already added 3 or 4 new species to the list."

It is a small matter about the plates : they can be bound separately from the letterpress, and the great fact is that they are so clearly and so beautifully executed—the lithographing and colouring being perfection.

We feel sure that no District Association or Library worthy of the name should be without this book. Indeed it is one that all Tea Companies and large individual proprietors should at once supply to their Managers for estate use.

THE TONACOMBE ESTATES COMPANY OF CEYLON, LIMITED.

Proceedings of the Third Ordinary General Meeting of shareholders held at Ambewatte House, on Thursday the 25th day of February 1897.

* By Ernest Green, F.E.S., Part I with 33 plates.—London, Dulan & Co.

Present:—Messrs. G. H. Alston, Chairman, and H. Cumberbatch Directors, and by their Attornies Col. H. L. Brooke, Col. E. Corse-Scott, Major A. H. MacNab, Miss A. A. Cumberbatch, Messrs. W. S. Bennett, W. Bowden-Smith, A. Fetherstonhaugh, and T. K. Wright.

The notice convening the meeting was read.

The minutes of the last meeting of the 28th February 1896 were read and confirmed.

Proposed by the Chairman and seconded by Mr. W. S. BENNETT that the report of the Directors as circulated among the shareholders be adopted.—Carried.

Proposed by Col. CORSE-SCOTT, seconded by Mr. T. K. WRIGHT:—"That a dividend of 10 per cent be declared for the year 1896, payable forthwith."—Carried.

Proposed by Col. BROOKE, seconded by Major MACNAB:—"That Mr. J. N. Campbell be re-elected Director of the Company."—Carried.

Proposed by Mr. FETHERSTONHAUGH, seconded by Mr. T. K. WRIGHT that Mr. Hercules J. Scott be re-elected Auditor for 1897.

A vote of thanks to the chair terminated the meeting.

CUMBERBATCH & Co.,
Agents and Secretaries.

REPORT.

ACREAGE.

The acreage of tho Company's Estates for the year 1897 is as under:—

	Acres.	Acres.
Tee in bearing	430	
Tea seed bearers	6	
Tca not in boaring	145	581
Coffee		55
Cardamoms in bearing ..	65	
Do. not in bearing ..	35	100
Total cultivated acreage ..		736
Forest and Fuel Plantations ..		31
Chena and Patna ..		894
Grand Total ..		1,661

The total quantity of tea secured during the year was 158,919 lb., which has been sold at an average of 51·34 cts. net per lb.

The total cardamoms picked amount to 7,872 lb., which heve been sold at an average of R2·22 per lb.

144 29-32nd bushels of coffee have been harvested and realised R2,163·60, or say R15 per bushel.

The total expenditure amounts to R51,489·03. The balance available after providing for depreciation amounts to R37,716·82, and the directors propose to pay a dividend for the year at the rate of 10 per cent absorbing R28,000 to place R9,120·11 to credit of extensions account, bringing the amount at credit of that account up to R17,000, and to carry forward R596·71 to next account.

The wire tramway alluded to in the last report has been erected and is working satisfactorily.

During 1897 it is proposed to plant 20 acres with tea.

The crops for 1897 are estimated as follows:—

190,000 lb. Tea
6,000 ,, Cardamoms
225 bushels coffce (Dry cherry)

against an expenditure of R59,863.

The Directors have arranged with tho Debenture holders to increase the amount of debentures to £7,000, reducing the interest from 7 per cent to 6 per cent from 1st January, 1897. The loan is fixed for 5 years certain.

Of the Directors Mr. J. N. Campbell rotires, but eligible for re-election.

An auditor for 1897 will have to be appointed at this meeting.

INDIAN TEA SALES.

(From *William Moran & Co.'s Market Report.*)

CALCUTTA, Feb. 17.

Virtually the last auction of the season was held on the 11th instant, when 11,978 packages were disposed of.

The quality generally was poor, with the exception of a few Assam invoices.

Colonial buyers took advantage of the lower prices ruling, and a fair quantity was secured for those markets.

Reuter's Telegrams, received since our last, report as follows:—

INDIAN TEA:—

February 11th—Auctions.—"Offered 40,000 packages. Sold 34,000 packages. Generally good demand. Common to medium qualities very firm. Average price, 9¾d."

Total Tea passed through Calcutta from 1st April to 15th February.

	1896-97.	1895-96.	1894-95.
Great Britain	131,245,566	120,223,505	114,140,191
Foreign Europe	436,258	276,295	240,254
America	1,926,909	1,080,234	586,187
Asia	4,190,289	4,787,951	3,710,311
Australia	6,263,192	6,581,356	4,766,195
	144,062,214	132,949,341	123,443,138

VARIOUS PLANTING NOTES.

TOBACCO.—In continuation of the discussion as to the growth and preparation of this product in Ceylon, we have to thank "J.M." for his very useful letter which will appear in our next issue. It is evident that if tea should begin to fail us—say in the older districts—of which there is no sign as yet—we need not consider "tobacco" as quite played out in the hands of planters.

CACAO AND CINNAMON IN THE AMBOINA ISLANDS.—In a paper read at the Colonial Museum at Haarlem on Dec. 12, 1896, and printed in the *Indische Mercuur* of Jan. 30, 1897:—

"On the means of restoring prosperity to and developing the Amboina Islands," the writer, G. W. W. C. Baron van Hoëvell, said (we translate from the Dutch):—"I must draw attention to two other cultures [besides coffee] for Serau, namely cacao and cinnamon. The first, at one time, tried on the little island of Amboina, gave poor results, and a number of extensive cacao gardens there have been destroyed by a disease that caused the fruits to turn mouldy, blacken, and fall off before these were ripe. This disease could now easily be warded off, as a remedy was discovered later on to prevent it: ginger root, planted round the stem, is an excellent trap-plant; and keeps away all diseases from the tree. The case is different in Seran, where I have seen at Awoya in the Elpahpoetih Bay plantations of cacao that were thriving excellently and had nothing to suffer from disease so far. The cultivation of cinnamon can also be recommended. I do not mean that of cassia, the wild variety, which is met with so plentifully in the uplands of Padang, but the true Ceylon cinnamon. I have seen specimens of it in the Amboina residency, which yielded a cinnamon that, according to experts, did not deserve to be classed as inferior to tho best Coylon."

CLOSETS, Urinals, Night Commodes, Stables, Kennels, &c. should be lightly dredged (after cleansing) with CALVERT'S 15 per cent CARBOLIC POWDER, to destroy bad odours and to kill or keep away insects.—The most effective preparation.—In ½ lb., 1 lb. and 2lb. dredgers, at 6d., 1s., & 1s. 6d. each, from Chemists and Stores.
F. C. CALVERT & Co., Manchester.

COLOMBO PRICE CURRENT.

(Furnished by the Chamber of Commerce).

Colombo, Mar. 2nd, 1897.

EXCHANGE ON LONDON: CLOSING RATES, *Bank Selling Rates*:—On demand 1/2 15-16; 4 months' sight 1/2 31-32; 6 months' sight 1/3.

Bank Buying Rates :—Credits 3 months' sight 1/3 5-32; 6 months' sight 1/3 7-32. Docts 3 months sight 1/3 3-16; 6 months' sight 1/3¼

COFFEE.—Plantation Estate Parchment on the spot per bus., R16·75 to 16·75. Estate Crops in Parchment, delivery no quotations. Plantation Estate Coffee, f.o.b. on the spot per cwt. R85·00 to 85·00. Liberian parchment on the spot per bushel, R7.00 to 7·00. Garden and Chetty Coffee, f.o.b. per cwt. no quotaions. Native Coffee f.o.b. per cwt. R65·00 Nominal.

TEA.—Average Prices ruling du ring the week Broken Pekoe, per lb. 45c. Pekoe per lb. 38c. Pekoe Souchong per lb. 25c. Broken mixd and Dust, per lb. 20c. Averages of Wednesday's sale.

CINCHONA BARK.—Per unit of Sulphate of Quinine per lb 03c.—1 to 5%

CARDAMOMS.—per lb, R2·25

COCONUT OIL.—Mill oil per cwt. R13·50 to 13·50 Dealers' oil per cwt. R12·75.—Coconut oil in ordinary packages f.o.b. per ton R300·00.

COPRA.—Per candy of 560 lb R45·00 to 45

COCONUT CAKE :(Poonac)f.o.b. per ton, R75·00,

COCOA.—Unpicked and undried, per cwt. R42·00.

COIR YARN.—Nos. 1 to 8 { Kogalla no quotations / Colombo ,,

CINNAMON.—Nos. 1 & 2 only f.o.b. 64c. Scarce
Do Ordinary Assortment, per lb 59c. do

EBONY.—per ton No sales

PLUMBAGO :—Large Lumps per ton, R310 ; Ordinary Lumps per ton, R260 ; Chips per ton, R120. Dust per ton, R90 — Fine qualities scarce

RICE.—Soolye per bushel, R3·60 to 3·75
,, per bag, R9·50 to 10·75
Pegu and Calcutta Calunda R9·75 to 11·00
Coast Calunda per bushel, R3·70 to 4.00
Muttusamba per bushel, R3·60 to R4·10.
Kadappa and Kuruwe per bushel, R3·45 to 3·80.
Rangoon Raw 3 bushel bag —R12·25

FREIGHTS.

Cargo.	Per ton London per str.	N. York per str.	Trieste per str.	Mar'lles per str.	Hamb', Bremen &c.
	s. d.	*s. d.*	*s. d.*	*R. c.*	*s. d.*
Tea	25/	30/	22/6	25	20/
Coconut Oil	20/6	..	22/6	25	20/
Plumbago	17/6	..	22/6	25	20/
Coconuts in bags	20/	..	22/6	25	20/
Other Cargo	20/	..	22/6	25	20/
Broken Stowage	10/	..	..	..	..
SAILERS.					
Coconut Oil	..	30/		..	..
Plumbago	..	28/9	..	..	..

LOCAL MARKET.

By Mr. A. M. Chittambalam, 7, Baillie St., Fort

Colombo, Mar. 3rd, 1897.

Garden Parchment :— Scarce per bushel
Chetty do :— (Nominal) R13·25 to 13·50 do
Native Coffee Scarce:— R65·00 to 66·00 per cwt
do f.o.b. do :— R70·00 to 71·00 do
Liberian Parchment, R12·50 per bushel (nominal)
do Coffee R63·00 to 64·00 per cwt
CARDAMOMS.— R1·75 to 2 per lb (nominal)
COCOA.—(nominal) R20·00 to 22·00 per cwt do
RICE.—Market is quiet :—
Kazla (Scarce)
Soolye R9 to 9·50 per bag
Callunda (Scarce)
Coast Callunda (Scarce) 3·50 to 3·60 per bushel
Kara 3·25 to 3·37 do
Muttusamba 3·50 to 3·75 do
CINNAMON.—Quoted Nos. 1 to 4, at 60c and Nos. 1 and 2 63 cents per lb (nominal)
CHIPS.—R85·00 to 87·50
COCONUTS.—Ordinary R32 to 37 per 1,000 (nominal)
do Selected 38 to 42 do do
COCONUT OIL.— 13·25 to 13·50 per cwt do
COPRA.—Market steady :—
Kalpitiya R41 to 42 per candy
Marawila 38 to 40 do
Cart Copra 33 to 36 do
POONAC.—Gingelly 85 to 900 per ton
Chekku 80 to 85 do
Mill (retail) 70 to 75 do
EBONY.—quotations at R100 to R195 (nominal)
SATINWOOD.—cubic feet 2·00 to 2·25 do
HALMILLA.— do 1·25 to 1·50 do
KITUL FIBRE.—Quoted at R28·00 per cwt (nominal)
PALMYRA FIBRE.—Quoted nominally :—
Jaffna Black.—Cleaned (Scarce)
do Mixed R16·00 to 17·00 per cwt.
Indian do R7·00 to 9·00 do
Do Cleaned 10·00 to 14·00
SAPAN WOOD.—Quoted 45·00 to 50·00 per ton
KEROSINE OIL—American 7·50 to 7·55 per case
do Bulk Russian 2·72 to 2·77 per tin
do Russian in Cases R5·90 to 5·95 per case
KAPOK.—Cleaned f. o.b :— R29·00 to 30·00 per cwt
do Uncleaned 8·00 to 9·00 do
Croton Seed Scarce do
Nux Vomica 2·50 to 3·00 do

CEYLON EXPORTS AND DISTRIBUTION 1896-97.

COUNTRIES.	Coffee cwt. Plan-tation	Coffee cwt. N'tive	Coffee cwt. Total.	Cinchona. 1897 B'nch & Trunk lb	Tea. 1897 lb.	Tea. 1896 lb.	Cocoa cwt.	C'moms lb.	Cinnamon. Bales lb.	Cinnamon. Chips lb.	Coconut Oil 1897 cwt.	Coconut Oil 1896 cwt.	P'bago 1897 cwt.
To United Kingdom	1795	..	1759	16273	13978583	12608234	9158	45662	168742	30038	7108	22193	13282
,, Austria	237	2	239	..	845	1415	..	..	100	..	668	3855	1
,, Belgium	..	..	..	..	..	1250	..	..	5000	6216	..	705	307
,, France	200	..	200	..	14468	11483	44	..	15000	560	..	..	202
,, Germany	115	..	115	..	..	23130	..	17201	41100	..	..	2342	8632
,, Holland	..	..	..	..	3705	..	..	..	..	..	..	..	..
,, Italy	..	..	..	..	115	1000	..	..	22500	22400	..	103	..
,, Russia	..	..	..	..	..	..	..	..	..	..	..	..	..
,, Spain	..	..	..	..	500	4200	..	..	15000	..	..	..	..
,, Sweden	..	..	..	..	1850	..	..	..	..	..	..	..	..
,, Turkey	..	..	..	..	300	3062	..	..	..	..	..	..	..
,, India	12	..	12	..	96812	193498	2	3870	61	..	13365	8987	..
,, Australia	449	20	409	..	1744893	1318302	60	..	100	7280	836	..	276
,, America	..	..	..	58547	185165	57126	..	..	10000	..	4010	1002	5309
,, Africa	..	..	..	..	12687	11710	..	..	..	..	..	..	..
,, China	15	..	15	4553	94239	34168	..	..	..	..	..	..	56
,, Singapore	..	..	..	..	3273	2088	..	..	..	..	4517	1404	..
,, Mauritius	..	..	..	..	..	..	..	..	..	..	..	..	..
,, Malta	..	..	..	..	..	17500	..	..	..	..	..	..	..
Total export from 1st Jan. to 2nd Mar. 1897	2823	22	2845	79373	16137435		9264	66733	277603	66494	30504		29064
do 1896	2658	91	3749	71967	14288166		6717	40290	181770	94132	40591		34747
do 1895	14296	20	14316	127226	15290267		9698	94698	271470	103938	60191		34791
do 1894	5168	85	5253	367442	12423050		3766	70357	230462	66046	49783		30193

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's Fortnightly Prices Current, London, January 27th, 1897.)

	QUALITY.	QUOTATIONS.
ALOES, Soccotrine ...	Fair to fine dry ...	44s a 100s
Zanzibar & Hepatic	Common to good ...	11s a 76s
BEES' WAX,		
Zanzibar & { White...	Good to fine ...	£7 a £8
Bombay { Yellow...	Fair ...	£6 a £6 10s
Mauritius & Madagascar...	Dark to good palish .	£5 15s a £6 5/
CAMPHOR, China ...	Fair average quality ...	112s 6d
Japan ..	,, .. nom...	117s 6d
CARDAMOMS, Malabar..	Clipped, bold, bright, fine	3s 1d a 3s 2d
	Middling, stalky & lean	2s 9d a 2s 11d
Ceylon.—Mysore ...	Fair to fine plump ..	4s a 4s 3d
	Seeds ...	3s 10d a 4s
,, Tellicherry...	Good to fine ...	2s 9d a 3s 6d
	Brownish ..	2s 6d a 3s
,, Long ...	Shelly to good ...	2s 6d a 2s 8d
,, Mangalore...	Med brown to good bold	4s 3d a 4s 6d
CASTOR OIL, Calcutta..	1sts and 2nds ...	3¾d a 4½d
Madras ..	...	3½d
CHILLIES, Zanzibar ...	Dull to fine bright ..	20s a 37s 6d
CINCHONA BARK.—		
Ceylon ...	Ledgeriana Chips ...	1d a 3½d
	Crown, Renewed ..	2d a 4½d
	Org. Stem	1¼d a 3d
	Hybrid Root ...	2¼d a 2½d
	Chip ...	1¼d a 2d
CINNAMON, Ceylon 1sts	Ordinary to fine quill...	11d a 1s 7d
2nds	,, ,, ...	10½d a 1s 5d
3rds	,, ,, ...	10d a 1s 4d
4ths	,, ,, ...	9½d a 1s
Chips	Fair to good	2¾d a 3½d
CLOVES, Penang ...	Dull to fine bright bold	4½d a 10d
Amboyna ..	Dull to fine ..	3d a 4½d
Zanzibar }	Good and fine bright .	2¼d a 2¾d
and Pemba }	Common dull to fair ...	2d a 2¼d
Stems	Fair ..	1d
COCULUS INDICUS ...	Fair ..	8s
COFFEE ...		
Ceylon Plantation	Bold to fine bold colory	118s a 123s
	Middling to fine mid ..	110s a 114s
	Low mid. and low grown	100s a 108s
	Smalls ...	92s a 99s
Native ...	Good ordinary ...	70s a 86s
Liberian ...	Small to bold ...	55s a 80s
COCOA, Ceylon ..	Bold to fine bold ...	63s 6d a 75s
	Medium and fair ...	55s a 62s
	Triage to ordinary ...	30s a 50s
COLOMBO ROOT... ...	Fair to good ..	25s a 27s
COIR ROPE, Ceylon ...		nominal
Cochin ..	Ordinary to fair .	£10 a £11
FIBRE, Brush	Ord. to fine long straight	£10 a £21
Cochin ...	Ordinary to good clean	£16 a £22
Stuffing..	Common to fine	£5 a £6 10s
COIR YARN, Ceylon ..	Common to superior ..	£12 a £26 10s
Cochin ..	,, ,, very fine ..	£12 a £34
do. ..	Roping, fair to good ...	£11 10s a £15
CROTON SEEDS, sifted...	Fair to good ...	80s a 82s
CUTCH	Fair to fine dry ...	9s 3d a 32s 6d
GINGER, Bengal, rough	Fair	15s 6d
Calicut, Cut A	Good to fine bold ...	70s a 85s
B & C	Small and medium ..	32s a 67s 6d
Cochin Rough...	Common to fine bold ..	27s a 32s 6d
	Small and D's	10s a 25s
Japan ..	Unsplit ...	15s
GUM AMMONIACUM ..	Sm. blocky to fine clean	17s a 36s 6d
ANIMI, Zanzibar...	Picked fine pale in sorts	£10 7s 6d a £13
	Part yellow and mixed	£7 17/6 a £10 10s
	Bean and Pea size ditto	70s a £7 12/6
	Amber and dk. red bold	£5 10s a £7 10s
	Med. & bold glassy sorts	90s a 137s 6d
Madagascar ...	Fair to good palish ...	£4 8s a £6 15s
	,, ,, red ..	£4 5s a £9
ARABIC E. I. & Aden ...	Ordinary to good pale	50s a 60s
Ghatti ..	Pickings to fine pale ..	25s a 60s
Kurrachee..	Good and fine pale	55s a 60s
	Reddish to pale selected	35s a 45s
Madras ...	Dark to fine pale	37s 6d a 45s
ASSAFŒTIDA ...	Clean fr to gd. almonds	40s a 80s
	Ord. stony and blocky	30s a 37s
KINO ..	Fine bright ..	£45 a £55
MYRRH, picked ..	Fair to fine pale	80s a 90s
Aden sorts	Middling to good ..	33s a 65s
OLIBANUM, drop ..	Good to fine white ..	31s a 60s
	Middling to fair ..	20s a 31s
pickings	Low to good pale	11s a 12s 6d
siftings	Slightly foul to fine	9s 6d a 11s
INDIARUBBER, Assam .	Good to fine	1s 10d a 2s 4d
	Common to foul & mxd.	3d a 1s 6d
Rangoon ...	Fair to good clean	1s 4d a 2s 1d
Borneo ...	Common to fine ..	1s a 1s 8d

	QUALITY.	QUOTATIONS.
INDIARUBBER, *(Contd).*		
Java, Sing. & Penang	Foul to good clean ..	1s 3d a 2s 3d
	Good to fine Ball ..	2s 2d a 2s 6d
	Ordinary to fair Ball	1s 2d a 2s 1⅞d
Mozambique	Low sandy Ball .	10d a 1s 1d
	Sausage, fair to good	1s 4d a 2s 5½d
	Liver and livery Ball...	1s 3½d a 2s 1½d
Madagascar	Fr to fine pinky & white	1s 11d a 2s 5d
	Fair to good black ..	1s 3d a 1s 10d
	Niggers, low to good...	10d a 1s 5d
INDIGO, E.I. ...	Bengal—	
	Shipping mid to gd violet	4s 4d a 5s 1d
	Consuming mid. to gd.	3s 4d a 4s 1d
	Ordinary to mid. good	2s 8d a 3s 2d
	Mid. to good Kurpah...	2s a 2s 10d
	Low to ordinary ..	1s 3d a 1s 11d
	Mid. to good Madras .	1s 4d a 2s 6d
MACE, Bombay, & Penang	Pale reddish to fine ..	1s 7d a 2s 9d
	Ordinary to fair	1s 2d a 1s 6d
	Chips and dark	11d a 1s 1d
MYRABOLANES, Madras	Dark to fine pale UG ..	3s 9d a 5s 6d
	Fair Coast ..	4s 9d
Bombay ..	Jubblepore ...	5s a 7s
	Bhimlies ...	4s 3d a 8s 6d
	Rhajpore &c. ...	4s 6d a 5s
Bengal ..	Calcutta ..	4s a 6s
NUTMEGS—	64's to 57's ..	3s a 3s 2d
Bombay & Penang	112's to 67's ...	1s 1d a 2s 11d
	160's to 130's ...	9d a 1s
NUTS, ARECA ...	Ordinary to fair fresh .	12s a 14s
NUX VOMICA, Bombay	Ordinary to middling..	4s 6d a 6s
Madras	Fair to good bold fresh ..	6s a 7s 6d
	Small ordinary and fair	4s 6d a 7s
OIL OF ANISEED ...	Fair merchantable ...	6s 7½d a 6s 9d
CASSIA ..	According to analysis..	6s 6d a 9s
LEMONGRASS ...	Good flavour & colour...	2¾d
NUTMEG ...	Dingy to white ...	3½d a 4d
CINNAMON ...	Ordinary to fair sweet...	4d a 1s 3d
CITRONELLE ...	Bright & good flavour ..	1s 1½d a 1s 2d
ORCHELLA WEED—		
Ceylon ..	Mid. to fine not woody .	10s a 12s 6d
Zanzibar. ..	Picked clean flat leaf .	10s a 20s
	,, wiry Mozambique	15s a 17s 6d
PEPPER - (Black)—		
Alleppee & Tellicherry	Fair to bold heavy ..	2⅝d a 2¾d
Singapore	Fair	2 23-32d
Acheen & W. C. Penang	Dull to fine ...	2½d a 2 11-16d
PLUMBAGO, lump ..	Fair to fine bright bold	15s a 17s 6d
	Middling to good small	3s 6d a 13s
chips ...	Dull to fine bright	1s 6d a 8s 9d
dust ...	Ordinary to fine bright	2s a 6s
SAFFLOWER ...	Good to fine pinky ...	85s a 90s
	Middling to fair	80s
	Inferior and pickings ...	60s a 65s
SANDAL WOOD—		
Bombay, Logs	Fair to fine flavour .	£30 a £50
Chips	... ...	5s a £3
Madras, Logs	Fair to good flavour ..	£30 a £50
Chips	Inferior to fine ..	£4 a £8
SAPAN WOOD, Bombay	Lean to good ...	£4 a £5
Madras	Good average ...	£4 a £5 nom.
Manila	Rough & rooty to good	£4 10s a £5 15s
Siam	bold smooth ...	£6 a £7
SEEDLAC ..	Ord. dusty to gd. soluble	70s a 80s
SENNA, Tinnevelly ...	Good to fine bold green	4d a 8d
	Fair middling medium	2¼d a 4½d
	Common dark and small	1d a 2d
SHELLS, M. o'PEARL—		
Bombay ...	Bold and A's	£4 17s 6d a £5
	D's and B's	£4 12s 6d a £4 15s
	Small	85s
Mussel ...	Small to bold	21s a 57s 6d
TAMARINDS, Calcutta...	Mid. to fine bl'k not stony	9s
Madras ...	Stony and inferior ..	6s a 7s
TORTOISESHELL—		
Zanzibar and Bombay	Small to bold dark mottle part heavy	17s a 21s 6d
TURMERIC, Bengal ...	Fair	8s 6d a 9s
Madras ...	Finger fair to fine bold bright	11s 6d a 12s
Do.	Mixed midlng.	10s 6d
Do.	Bulbs	8s a 9s
Cochin ...	Finger	10s
	Bulbs	7s 6d a 8s
VANILLOES—		
Mauritius and } 1sts	Gd. crystallized 3½ a 9 in.	19s 6d a 33s
Bourbon } 2nds	Foxy & reddish 4½ a 8 ,,	17s a 22s
Seychelles 3rds	Lean and inferior ..	10s a 16s
VERMILION ...	Fine, pure, bright ...	2s 4½d
WAX, Japan, squares	Good white hard ...	39s 40s

THE

AGRICULTURAL MAGAZINE,

COLOMBO.

Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."

The following pages include the Contents of the *Agricultural Magazine* for March :—

Vol. VIII.] MARCH, 1897. [No. 9.

SEASON REPORTS FOR JANUARY, 1897.

W*ESTERN PROVINCE.*—Maha paddy harvest has begun. No dry grain cultivation worth noting. Fruits and vegetables scarce generally except in the Colombo district, where the supply was good and prices moderate. Rainfall light. Harvest prospects may be said to be generally fair.

Central Province.—Maha paddy nearing maturity in most parts, prospects fair. Dry grain crops fair. Indian corn and Kurrakkan cultivation very satisfactory in Walapane. Health of cattle good. Rain fell in most parts excepting Udunuwara, fall registered in Matale, 3·95 in.

Northern Province.—Paddy crops being harvested, prospects good. Dry grain crops satisfactory; out-turn in Mannar below average owing to damage by floods. Rain more or less general: in Jaffna, ·82 in., in Mannar ·72 in. Murrain reported to have broken out at Kalvilan, in Tunukkai division.

Southern Province.—Only a middling paddy harvest is to be expected. Vegetables in Galle district scarce. Rainfall in Galle, 1·56 in.

Eastern Province.—Paddy much damaged by flood in Batticaloa district, in Trincomalee district thriving in nearly all parts. Dry grain crops also suffered from the same cause. Fair prospects of Tobacco in Trincomalee district. Rainfall in Batticaloa 10 in., in Trincomalee 11·16.

North-Western Province.—In the Kurunegala district paddy and dry grain prospects good, health of cattle good, except in Dambadeuni Hatpattu and Katugampola where murrain has been reported. Prospects of grain crops good in Puttalam district. Rainfall in Puttalam 1·20 in. Reaping of maha in Chilaw district where rain has done some damage.

North-Central Province.—Paddy crop in various stages, good harvest expected throughout the Province. The severe murrain of last year causes great scarcity of buffaloes for agricultural work. Rainfall at Anuradhapura 6·92 in. A few cases of murrain in Kalagampalata.

Province of Uva.—Yala harvest in progress, yield good. Preparations for maha crop going on, but delayed—some fields being abandoned—owing to floods. Indian corn and Kurrakkan ripe and ready for harvest. Fruits and vegetables plentiful and cheap.

Province of Sabaragamuwa.—In Ratnapura districts paddy promising, though rain has caused damage in some parts. Fine grain prospects good. Preparations going on for Yala paddy and dry grain. In Kegalle district, maha paddy being harvested and yield very good. Dry grain crops satisfactory. Rainfall registered at Ambanpitiya 2·34 (on three days), at Ruanwella 2·31 (on three days).

RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF FEBRUARY, 1897.

1	Monday ..	Nil	18	Thursday ..	·18
2	Tuesday ..	Nil	19	Friday ..	Nil
3	Wednesday ..	Nil	20	Saturday ..	Nil
4	Thursday ..	Nil	21	Sunday ..	Nil
5	Friday ..	Nil	22	Monday ..	Nil
6	Saturday ..	Nil	23	Tuesday ..	·51
7	Sunday ..	Nil	24	Wednesday ..	Nil
8	Monday ..	·15	25	Thursday ..	Nil
9	Tuesday ..	Nil	26	Friday ..	Nil
10	Wednesday ..	1·55	27	Saturday ..	Nil
11	Thursday ..	·05	28	Sunday ..	Nil
12	Friday ..	Nil	1	Monday ..	Nil
13	Saturday ..	·05			
14	Sunday ..	·06		Total ..	2·80
15	Monday ..	·25		Mean ..	·10
16	Tuesday ..	Nil			
17	Wednesday ..	Nil			

Greatest amount of rainfall in any 24 hours—on the 10th Wednesday, inches 1·55.

Recorded by A. R. JEREMIAH.

THE USE OF THE LACTOMETER.

It cannot be denied that the lactometer is a very convenient and handy instrument to use in the testing of milk, but we would impress upon those who pin their faith to it, the necessity for making sure that the instrument they employ is correctly graduated, by verifying its readings, first, by using it with pure water reduced by ice to 60° F., and next with milk cooled down to the same temperature. In the former case the lactometer, if correctly graduated, should stand at the 0 mark, and in the latter at 30 or 1030 as the instrument is marked.

Dr. Wanklyn, the well-known chemist, speaks strongly against the lactometer in his work on milk analysis. He says that in some manuals intended for the guidance of medical officers of health the use of the lactometer is recommended—one of them in particular by Dr. Edward Smith claiming a sort of pseudo-Government sanction for its use, and commending it as being for milk what the hydrometer is for alcoholic fluids. "But," to quote Dr. Wanklyn's own words, "although it is so very popular, and although it has been so implicitly trusted, the lactometer is a most untrustworthy instrument. There hardly ever was an instrument which has so utterly failed as the lactometer. It confounds together milk which is exceptionally rich with milk which has been largely watered." The same writer makes reference to a prison not far from London where the prison authorities are very particular about their supply of milk. They allow no milk to enter the prison unless it comes to the M mark on the lactometer, which the milk purveyor reaches *by skimming the milk.*

Taking the specific gravity of pure milk to be 1030 (which should correctly be written 1·030) at 60° F., an easy way of making the necessary correction for the reading of the lactometer at tropical temperatures is to add 4 to the reading at 85° F. and to add 5 to the reading at 90° F. In Ceylon the lactometer should always be used in conjunction with the thermometer. If the temperature of the milk be found to be 85° and the reading of the lactometer is 1026, the inference would be that the milk is of the best quality since a specific gravity of 1026 at 85° F. is equivalent to 1030 at 60° F. Indeed a lower specific gravity than 1026 at 80° F. need not convey the idea that the milk has been watered, particularly when it is borne in mind how simple a matter it is to raise the specific gravity either by adding foreign matter or by *abstracting* cream. (N.B.—Let it further be remembered that milk abnormally rich in cream shows a specific gravity below the normal.)

But let no believer in the lactometer imagine for a moment that because an instrument is purchased from this or that store, it is therefore correctly graduated. Indeed, it is quite a common experience to find lactometers from wheresoever purchased, incorrect by 2 or 3 markings for which due allowance has to be made. Let this error be discovered by testing the lactometer with water at 60° F. We have known the same milk tested in one establishment to show a difference of nearly 10 in specific gravity when tested at another.

OCCASIONAL NOTES.

It must be gratifying to those connected with the Agricultural College in Madras to find how willing both the Government and the representatives of the public are to help on their work. The late discussion in the Legislative Council there shows that the Agricultural College is not being supported merely because it is a Government institution, but because the Council was convinced of its duty to do all in its power to further the interests of the agricultural classes in the Presidency, and give the greatest possible support to the institution which is working for those interests, Indeed, it would have been a reproach in this XIXth century to even the Government of the "benighted presidency" if it confessed its unwillingness to forward the cause of agricultural education in India.

Those who know the history of agricultural education and reform in England will have some knowledge of the difficult and discouraging nature and the snail-like progress of that work. India is going through the same experience, and she is content to struggle on and persevere in her efforts. Is little Ceylon, then, grandiloquently termed the *first* of Crown Colonies, to be the last in the race for agricultural reform? And it too an eminently agricultural colony?

The spirit in which the discussion in the Madras Council was carried on might well be emulated by any body of senators, for while the subject was thoroughly threshed out for the benefit of those who asked for information, there was no wild talk on the one hand and no tendency to suppression of facts on the other. In the absence of these latter unfortunate circumstance the result of deliberation and discussion was what was to be expected, viz., sound commonsense and truth, and in the end these prevailed.

A planting correspondent in writing to us enquiring where he could get "Homco" manure, and expressing his desire to get two tons of it, says: "It made my cocoa and orange trees *jump*!"

The number of applications for admission into the Colombo School of Agriculture have increased appreciably this year.

The Final Examination of the Forests Students took place on the 15th February and the following days. The results have not been announced as yet.

The Entrance Examination for candidates seeking admission into the Forestry School was held on the same days. Seven candidates presented themselves. The three first who passed were in order of merit—Richard de Silva, Lucas Mendis, and M. A. Fernando.

In November last the highest rainfall for the month (according to the Surveyor-General's return) was that recorded at Digalla, Awisawella viz., 34·80 in., the rainfall at Sogama, Passellawa, running this close with 34·63. The lowest re-

corded rainfall was at Hambantota, viz., 6·08 in. The heaviest rainfall on any one day was that recorded on Horakelle Estate, Chilaw, viz., 9·15 in.

In December the highest rainfall for the month (according to the Director of Public Works' return) was at Rukam in the Eastern Province, viz., 57·84 in., and the lowest at Tangalla, viz., 5·47 in. ; while the heaviest rainfall on any single day was that recorded at Duckwari, in the Central Province, viz , 12·32 in.

JADOO FIBRE.

We are glad to be able to announce the receipt of a quantity of Jadoo fibre, in pressed bales, from Exeter, the headquarters of the Jadoo Company, Limited. In our last issue we expressed our willingness to forward small quantities to those who may wish to give a trial to this new and highly-spoken-of growing medium. The price of the Jadoo fibre per 60 bushels (about one ton) is £5·10. F. O. B. London, Liverpool, or Southampton. The following are some directions for the use of the fibre :—

Always use the Jadoo in a moist condition.

The Sowing of both Tea and Coffee in Jadoo should be carried out exactly the same as in earth ; put a small quantity of Jadoo into the trench, making a layer about three inches deep, sow the seed in it, and cover lightly with earth. A three-bushel sack of Jadoo should be sufficient for 450 plants in this way, and can be used again and again for fresh sowings.

For growing "supplies" of Tea or Coffee in baskets—*one-half* Jadoo should be used, and this should be placed at bottom of the basket.

For old Coffee or Tea Plants.—Scrape away carefully about three inches of earth round the tree, and mix the earth so removed with about ¾ peck of Jadoo, replace it and cover over with leaves, &c., so as to *retain the moisture* in the Jadoo. The same treatment should be adopted for Oranges and Mangoes, in every case taking care that there is a sufficient covering of earth or leaves to retain the moisture in the Jadoo. Where Coffee is not grown on the "supplies" system, a very small quantity of Jadoo should be placed in the holes in which the Coffee seedlings are planted. This will bring them to maturity sooner and make the trees healthier.

For Sugar Cane.—A small quantity should be put at the bottom of the holes in which Sugar Cane cuttings are inserted, thus ensuring the striking of the cane, stimulating root action, and retaining moisture around the roots during the dry season. A handful of Jadoo round the cutting is all that is needed, as it is not wanted as a manure, but simply to encourage formation of roots.

Sugar Cane has been rooted strongly in Jadoo in 10 days.

For Indigo.—A very small quantity of Jadoo Fibre, placed at the bottom of the drills in which Indigo is sown, will have a marked effect on the crop.

For Tobacco it will be found invaluable, both for forming beds to sow into, and also when the young plants are transplanted to permanent positions.

For potting foliage and flowering plants Jadoo fibre is highly recommended. The fibre should be pressed tightly round the roots of the plant. As bought, it is said to have sufficient in it to be fit for use, but if it has become dry it should be moistured slightly before using ; in any case the plant should be watered directly after potting. Afterwards care should be taken not to over-water. Plants growing in earth can, it is said, be transplanted into Jadoo fibre without much risk. To do this successfully it is recommended that the plants should be kept dry for 24 hours so that the earth will come off easily from the roots which should, after the plant is taken out, be plunged into tepid water and gently moved about until the earth is all washed off. Care should, of course, be taken not to injure the roots. The new pot should be filled to one-third its capacity with the damp fibre, and the roots of the plant to be grown spread out on it, while the rest of the fibre should be pressed down on the top of them so as to completely fill the pot. The plant should be shaded at first and gradually exposed to sun and air.

Jadoo fibre has the advantages of being a *clean* substance, of being able to retain moisture, and supply the plants grown in it with nutriment ; and it is further stated of it that it gives a better colour to flowers, and a richer and deeper texture to the foliage, causing the marking on leaves to come out clearer.

We have been supplied with a number of copies of testimonials as to the value of Jadoo fibre in raising coffee, tea, cocoa and orange seedlings. To some of our subscribers interested in the new growing medium, we were able to forward leaflets containing testimonials and other information regarding the fibre, with the last issue of the Agricultural Magazine.

We should conclude this notice by extracting a passage from Col. Halford Thompson's lecture on Jadoo Fibre at the People's Palace, which refers to the manufacture of the substance :—

"The foundation of it is what is known as 'peat moss' which is exceedingly spongy and capable of absorbing into its composition any chemicals into which one may wish to impregnate it. The peat moss is boiled with certain chemicals. The exact nature of these chemicals I will not allude to in this lecture, ... but it is sufficient to say that in the composition of Jadoo, every chemical element is present that under any circumstances is required for plant food, and to ensure the thorough amalgamation and decomposition of these chemicals the fibre is fermented in a particular way after the boiling process is completed. It is on the careful carrying out of this fermentation, and checking it at a certain point, that the success of Jadoo depends."

We can only hope that those who try the fibre will find that it possesses all the valuable and useful properties claimed for it.

HEPATITIS (LIVER DISEASE) IN CATTLE—(A SO-CALLED OBSCURE DISEASE).

In the January number of the "Agricultural Magazine" a note is published on a little known disease among cattle : it runs : "A curious form of disease about which practically nothing is known occurs among stock in Ceylon. Among the

symptoms are *increased respiration*; *a darkening of the colour of the coat*, either completely or in patches (while the *hair of the coat at the same time tends to become long*), and in milch cattle *loss of milk.*" The above are no doubt some of the principal symptoms that are seen and observed at a glance. However, the writer has had opportunities of examining animals said to be suffering from the complaint noted above and some of the identical animals from which the above particulars have been gathered. In addition to these principal symptoms, one also observes a slight abdominal distention in the affected animals, yellowish tinted mucous membranes, and altered dung. The animal is sluggish and dull and the pulse is very weak. From these and other symptoms it is evident that the animals suffer from a liver complaint and that no other than inflammation of the liver (*Hepatitis*).

The reason of this disease being described as a "new form of desease" is that as liver desease is somewhat rare in cattle, it is only seldom one gets the chance to study it, unless it be in a tropical country. Steele, in his admirable work on the diseases of cattle, writes as follows under *hepatitis*, :—" It is sometimes seen in high-bred animals fed with an excessive amount of highly stimulating food associated with want of exercise. It is most prevalent in hot weather. It is also attributed to changes of temperature and of food, as well as to exposure of various kinds."

Now the Government dairy cows that suffered from this complaint were well-bred animals (comparatively), were fed with a large amount of stimulating food, and had very little exercise; for, the Sind cows that were brought down to the Government Dairy, were in their native land not fed with stimulating food, and, with the cattle breeders of that district, it is the invariable practice to allow their animals a deal of exercise so that they had to cover miles and miles of ground daily in their pastures. It is the same case with the South Indian cows that get affected with the complaint at the Government Dairy. They are bought off a cattle-dealer, who brings them from the interior of Southern India, where there is not plentiful pasturage and where the animals daily have to cover a large area of ground in picking up their food. These are brought to Colombo and the dealer keeps them in his stalls and feeds them up with stimulating food to bring them in condition. We have also the authority of Professor Gamjee to account for numbers of animals getting affected at the same time; the Professor cites instances where hepatitis had assumed almost epizootic forms in hot climates. So far then all the causes that lead to hepatitis were found in this particular instance, and we will also see presently that the symptoms of hepatitis were present in the dairy cows that were affected with this "curious form of disease."

Professor Steele, in describing the symptoms of the disease, says that " yellowness of the visible mucous membranes and of the skin is considered diagnostic of liver disease *but it is not always so*. . . . a certain amount of abdominal distension is observed, the bowels are torpid and fæces dry, scanty and of a chocolate colour, milk is scanty, skin is *harsh staring* and coated with a *yellowish browny* matter, the respiration is somewhat impeded and the pulse is soft, weak and frequent. *Lameness of the right fore limb has not yet been observed in cases of this kind in the ox.* The animal is very dull." Almost all the above symptoms were present in the affected animals. Impeded respiration, darkened coat, hair tending to become long (staring coat), loss of milk, the general symptoms observed by even a casual observer, are symptoms of hepatitis.

Those who are acustomed to a deal of theory without much of its practical application would, no doubt, be disappointed to find two of the so-called patent symptoms in liver disease, yellowness of the visible mucous membranes and the skin, and lameness of the right fore limb, absent in the disease which affected the animals in question, and hence the idea of liver disease might have entirely escaped them, but what does Steele say under the very disease *Hepatitis*: Yellowness of the mucous membranes and of the skin is considered *diagnostic of* liver disense, *but it is not always so. Lameness of the right fore limb has not yet been observed in cases of this kind in the ox.*

So then this curious form of disease was nothing else than hepatitis, and Professor Wallace, with his well-trained practical eye, detected the cause without even being acquainted with the history of the cases.

The writer had no difficulty whatever in pronouncing the cases to be hepatitis on their very first appearance and it well worth testing that opinion by adopting the treatment for the disease in even a few cases. It may be mentioned that such drugs as dilute hydrochloric Acid, Ammonia Chloride, Magnesium Sulphate and Ipecachuana answer well in affections of the liver in domestic animals in warm climates.

W. A. D. S.

THE COCONUT PALM.

In an account of the coconut palm Dr. George Watt gives the following instructions as to its cultivation in his Dictionary of the Economic Products of India:—

SOWING.—Ripe nuts, carefully collected, should alone be employed, and for this purpose they are usually gathered from February to May. Seed from very young or very old trees should be avoided. After having been kept for a month to six weeks they should be planted. This may take place in January to April, or again in August, provided the rains are not heavy. The seed beds should be dug 2 feet deep and the nuts planted 1 foot apart. The nuts should be laid on then, leaving 2 inches of their surface exposed. Ashes, or ashes and salt, should be freely placed in the trenches; these act both as a manure and as a preventative against insects. The seed-bed thus prepared should be kept moist, but not soaked. The germinated seeds may be transplanted when they are in their second to their sixth or even twelth month. In the Godaveri district they are placed in their permanent positions when three to four years old. In damp localities the transplanting may be done in the hot season, otherwise during the rains.

TRANSPLANTING.—The seedlings should not be put out in the plantation, pits 12 yards apart

having been prepared for them. In rich soils the pits may be small, but in poor soils 1 to 2 yards wide and 2 to 3 feet deep. In cold clay soils these pits should be filled with sand. In marshy land walls should be constructed round them. Ashes are often recommended to be freely mixed with the prepared soil to be put into the pits, as this is supposed to prevent the attacks of the beetles that prove so destructive to the trees. Cultivation of turmeric, arrowroot &c. in the pits, along with coconuts is believed to be beneficial. The soil round the seedlings is also often kept damp by a bed of leaves, particularly such as will not encourage, but rather check, the approach of ants into the prepared soil. If the soil be naturally poor, salt, ashes, paddy-straw, fish manure, goat's dung, and dry manure may be added during the first year.

Treatment of Plantation.—By the end of the first year the normal leaves will begin to form, and at this stage the soil around the plants should be dressed and ashes added. Every succeeding year the ground should be opened out and manured about the close of the rains. By the fourth year the stem begins to appear and has about 12 leaves; it is distinctly visible by the fifth year, when the tree has about 24 leaves. The spathes commence to be formed by the sixth year, and the stem is then 1 to 2 feet above the ground, but in exceptionally favourable climates and soils it may be three or four times that height. The first few spathes do not form fruits, but bye-and-bye they begin to do so, and in three or four more years the tree is in full bearing. Dr. Shortt says that in good soils and if watered the coconut begins to yield in the fifth year, but in poor soils and if not watered they only commence to yield in the seventh or not till the tenth year. About six months after flowering the fruits set, and by the end of the year they are fully ripe.

Coconut palms may be easily transplanted, and indeed often with advantags. Some of the fibrous roots should be cut away, and manure, together with a little salt, placed in the pit in which it is intended to plant the tree.

As a rule, the coconut throws out a spathe and a leaf every month; each flowering spike yields from 10 to 25 nuts. The produce of a tree in full health and properly tended may be from 50 to 120 and even 200 nuts a year, the yield depending greatly, of course, on the suitability of the climate and soil for coconut cultivation; a safe average would be 100 nuts a year to each tree in full bearing. The coconut will continue to bear for 70 or 80 years.

NOTE ON LAC BY M. RIDLEY, Esq., SUPERINTENDENT OF HORTICULTURAL GARDENS, LUCKNOW.

Regarding the statement commonly made, and as generally believed, that "if lac is not removed from trees it will in time destroy the trees," I have practically demonstrated and proved in the most conclusive way that the above theory is incorrect and entirely at variance with fact. When I first came here, 23 years ago, the matter then came under my notice; many large trees in the Wingfield Park, Residency Grounds and the station avenues were badly infested with lac, and the plan then in vogue was to sell the lac to contractors, who in collecting it denuded the trees to a most objectionable extent. This led me to think of some way or means of keeping the trees clear of the pest. A Forest officer informed me that this could be done by lopping off all the leading branches and afterwards stripping the branches and stems of all leaves and twigs, the object being to divest the trees of all infected parts and to remove all trees of the lac insect and so prevent its breaking out on and spreading over the trees so treated again.

I adopted this plan with one or two trees in the Wingfield Park, but found it ineffectual, as on the new branches and shoots which were developed lac again appeared as bad as before. This plan proved an entire failure to protect or keep trees clear of lac.

I then decided to stop lac collecting on a few trees, to test and prove the theory about its destroying the trees. The result of this experiment was that after a time the lac all disappeared and the trees in a short period recovered from the effects of the lac and became perfectly clean and healthy again. This is absolute fact, and I can show numerous large peepul and pákar trees which at one time were so infected with lac as to be most unsightly objects, now entirely free from the pest and the trees healthy and vigorous.

On the representation I made to Mr. Boys, when Deputy Commissioner here, he passed an order prohibiting the sale of lac from trees in the station, and since then I believe no lac has been collected from trees on avenues and groves in Lucknow; certainly none has been collected from any of the gardens or other public grounds in my charge, and there has been no loss of trees in consequence.

For some years there has not been much lac on trees in Lucknow, at least on those under my immediate observation; but whether this decrease of lac pest is due to collecting being prohibited or to the seasons not favouring its spread I am not prepared to pronounce an opinion, but the fact remains that it has been much less in evidence for the past five or six years than it was for many preceding years.

I have often been told that the lac gatherers inoculate trees to spread and propagate lac. The results here rather favour that statement. Prohibition may have shown them that they gain nothing by spreading it, and this may have led them to cease inoculating trees; but on this point conclusive and certain evidence is not forthcoming.

I most decidedly do consider that trees are injured by the way lac is generally collected, owing to the removal of such a large portion of the young twiggy growth of the trees.

Near and in towns the object of this free removal of twigs is two-fold: one, to obtain as much lac as possible, the other, to make money by selling the twigs for firewood. If proper and efficient supervision could be provi ed, lac might be removed to some extent by collecting dead twigs and a small proportion of the finer ones. The trees would not suffer to any appreciable degree if collecting was done in this way; but, as the necessary supervision to ensure this is not available,

prohibition is, in my opinion, the only safe method to follow.

The theory mentioned at the beginning of this note comes no doubt from persons interested in lac and is a purely selfish one.

Others have accepted it from want of evidence to combat it, and so it has come to be very generally accepted as fact. For this reason it would probably be useful to circulate the facts and experience given in this note.

M. RIDLEY,
Superintendent Government Gardens, Lucknow.
6th June 1896.

[In Ceylon we have a number of lac-producing trees, among which are the two mentioned in the above note, viz., Peepul (*Ficus religiosa*), Sin. Bo; Pákar (*Ficus infectoria*) Sin. Kalaha.]—ED. *A.M.*

MILK AND MILK PRODUCTS.

BY MR. JAMES MOLLISON,
Superintendent of Farms, Bombay.
(*Continued.*)

The butter is now sufficiently washed to be removed from the churn to the butter-worker by means of two wooden scoops. The butter-worker is a simple arrangement, whereby, in a wooden trough, a grooved roller kneads the butter completely free of butter-milk. The butter-milk escapes down the inclined plane which forms the floor of the trough, and runs through a tap hole to a vessel placed to catch it below.

When thoroughly worked, the butter is in a condition to be made up into marketable form. By the use of "Scotch hands" and wooden butter prints or moulds, it can be made up at once into pats for immediate sale. If it is necessary to keep the butter any time, it should be preserved with salt. One per cent. salt is sufficient to preserve butter in good condition for a few weeks, whilst 3 to 4 per cent. will keep it good for months.

Fine table salt should be used. Before it is mixed with the butter it should be powdered very fine with the roller (an empty bottle does very well for the purpose). The salt should be mixed with the butter by thorough working on the butter-worker, a little salt being sprinkled each time the butter is kneaded by the butter-worker. I have proved that butter preserved in this manner, if packed tight in earthenware "crocks" with tight-fitting lids, will, in a comparatively cool place, keep good for months. Moreover, when required for use, the butter could be washed almost free of salt by the free use of pure cold water and of the butter-worker. Improved dairy machinery is designed with the object of making it unnecessary for the dairyman to touch with the hands, either milk, cream or butter, which, in India, is a point of significant importance.

The ordinary method of hastening the ripening of cream is to add to it a little sour milk which, however, must be clean and free from any foreign taint or flavour.

Butter should be made in India in the early morning when the dairy is cool.

Ripe cream before it is churned should be cooled; 55° F. or 60° F. is the proper temperature. The temperature of cream is lowered by adding ice or by setting the cream *in its vessel* in cold water. The cooler the cream is churned, the firmer the butter will be. The churn should revolve about 55 times per minute. The best results are got when the butter comes in half an hour. If it comes much sooner it is probable that the cream has been over-ripened. If the cream is not equally ripe, *i.e.*, if during ripening it has not been well stirred and thoroughly exposed *equally* to the air, that at the bottom of the vessel will be less ripe than that at the top, and in the process of churning the ripe or overripe portion of the cream will form into butter granules first. If this occurs, a good deal of cream which has not been converted into butter, will be removed with the butter-milk, and will be lost unless the butter milk is kept for 24 hours, during which period the unchurned cream will rise to the surface of the butter-milk and may be skimmed off. In India a good deal of cream is recovered in this manner during the hot weather. Even under the most careful management some cream will be lost in the butter-milk at this season. The cream from buffalo's milk can be churned at a high temperature than that from cows and yet produce equally firm butter. The feeding of the milch-cattle, as already noted, also influences the temperature at which firm butter can be churned. Colouring matter, if desired, should be added before churning. It is made from 3 oz. annatto seed digested for an hour in 8 oz. pure olive oil and then strained through fine muslin. One tea-spoonful is sufficient for the cream of 40 lbs. buffalo's milk, *i.e.*, for about 4 lbs. of butter. Colouring matter, which is more concentrated, is made as follows: 4 oz. of ground annatto seed is put in a glass flask and just covered with rectified spirit. This mixture is allowed to digest for 7 days. The rectified spirit dissolves the colouring matter from the seed and a pure solution is obtained by straining through muslin. This solution is, however, unsuitable for colouring butter, because the spirit would taint the butter. The mixture is therefore placed in a cooking vessel with 1 lb. of sesamum oil and carefully heated; the spirit is entirely evaporated and the solution is transferred to the oil. The colouring matter thus prepared is placed in a bottle when cool and kept corked to be used as required.

BOTTLING AND CANNING FRUIT.

To preserve fruit in a fresh state it is necessary to raise the temperature above 160 deg. F. to destroy the germs of fungoid growths which promote decay, and to close the receptacles perfectly airtight while at or above the degree of temperature given above. For general use, and to allow a margin on the operator's side, the boiling point 212 deg. F. is usually adopted. The fruit should be sound, firm, ripe—but not "squashy" to the touch. The tin or bottles should be of the size suited to holding enough for one dish for the household, and it must be observed that the fruit will decay if allowed to stand for any length of time after being exposed to the air—for at once on being opened fresh germs fall upon it from the air and set up growths which hasten decomposition. Tins are cheaper than glass jars and therefore are used more, but as they have a tendency to oxidize and become useless in about a couple of seasons, the glass jars are probably

cheapest in the long run. If cans be used the self-closing or patent topped cans are the best, as very few persons care about the trouble of soldering on the tops, and having to cut away the lids when opening for use. The general complaint against the tins is that they often rust on the insides of the lids, and impart their nasty rusty flavour to the fruit. To avert this, small circular discs of greased or oiled paper could be placed over the holes before the lids are forced down, this precaution should also be observed where the patent screw-topped glass jars are used if the tops are made of tin. For cooking the fruit any ordinary stew pan may be used, but an ordinary washing copper if well cleansed acts well.

There are various methods advocated by authorities on the subject, those mostly in vogue are firstly:—Pack the fruit into the jars or cans, boil the syrup in another vessel for ten minutes, stand the jars or cans in a shallow pan with water reaching to within an inch of the top of the cans or jars, cover the pan and bring the water to a boil for several minutes, then pour the boiling syrup over the fruits quite filling the cans or jars. Keep the water round them boiling for a few minutes longer, until no air bubbles rise up through the fruit, then put on the lids and while still hot run a little beeswax or parafine wax around the rims.

The other method, and no doubt the best for small householders, is to place the fruit and prepared syrup into a common washing copper, and stew it until it is of sufficient softness, but yet firm enough to hold its shape when being carefully ladled into the tins or jars while still hot. The jars or cans should then be placed into a shallow vessel or pan, and the water surrounding them brought to a boil until all air bubbles cease to rise among the fruit, then seal down as in the first method. Such little points as putting straw or cloths around the jars to prevent them touching when in the shallow pan; or placing straw or split pieces of deal or wood upon the bottom of the pan to stand the jars upon—to keep them off the bottom, or not allowing the bottles of fruit when very hot to stand in a cold draught, are all well known to every housewife.

It will always be well when cooking to err on the side of under cooking, as the fruit can be stewed a little if necessary when opened for use. The matter of putting syrup or only pure water into the jars is a matter of taste, as it has very little if anything to do with the preservation of the fruit. The authorities on syrups vary from 4 oz. to 1 lb. of sugar to each quart of water, and the times for cooking for various fruits are widely different, but this is a point which must be worked out by the operator according to the ripeness of the fruit under treatment.—*Adelaide Observer.*

RINDERPEST IN THE WANNI AND ADJOINING DISTRICTS.

In concluding my remarks on the prevention and suppression of rinderpest, I cannot do better than give a summary of the rules laid down under this head in Veterinary Major Mills' treatise on Cattle Diseases.

(1.) Stray animals should be prevented from coming in contact with healthy cattle.

(2.) All animals which have been recently bought or have been in contact with strange ones should be kept apart from others.

(3.) Whenever an animal shows signs of sickness of any kind he should be kept separate from healthy ones and watched, his food and drinking water being brought to him.

(4.) Cattle suspected of rinderpest should be kept strictly apart from the rest, at a distance of at least 500 yards. All their bedding, gear, dung, &c., should be destroyed by burning. Dogs, crows, &c., must be kept out of the Hospital Pound as much as possible.

(5.) The stall or shed in which a diseased animal has been, should be disinfected by burning sulphur about the place, or by sprinkling a solution of Carbolic acid, Jeye's fluid or some other disinfectant. The floor should be dug up and fresh earth placed, and all walls and wood work whitewashed.

(6.) All animals which have been in contact with a diseased ones should be thoroughly washed with a disinfectant solution and should be kept apart from the healthy.

(7.) The men attending on the sick cattle should not be allowed to approach the healthy animals.

(8.) Animals that recover should be well washed and pastured for at least a month apart from the herd.

(9.) The carcases of animals that die of rinderpest as well as the litter, dung, &c. of all the infected ones should be burnt.

In order to carry out these rules in the villages of the interior, there ought to be a special Veterinary headman resident in every large cattle village. The present minor headmen are too busy with other work to devote sufficient time and attention to matters connected with the welfare of the cattle. Prompt measures are of the utmost importance in the suppression of the cattle plague. It is hardly of any use to attempt to suppress the disease about the tail end of an outbreak.

Treatment.—When Rinderpest breaks out in Europe it assumes a most virulent form and is not amenable to treatment. Says Professor Williams, "The cattle plague may be classified as one of those diseases in which all methods of medical and hygienic treatment have hitherto proved unsuccessful, and judging from the nature of the malady, always will prove unsuccessful." Professor Steel says: "Numberless receipts have been submitted, tested, and proved worthless. We can name no agent capable of acting as an antidote to rinderpest poison."

These remarks, however, have been made with special reference to the plague as it occurs in most European countries, and do not apply with the same force to the form in which it is often found in Siberia, India and Ceylon. It has been observed that in localities where the disease is enzootic, such as in many Asiatic countries, it often assumes a milder form, and is then amenable to treatment to a certain extent. It is the opinion of the Indian Cattle Plague Commissioners that at least 20 per cent. of animals which would otherwise die may be saved by suitable treatment.

The indications for general treatment are to help nature in getting rid of the virus from the system, to support the strength of the animal by careful nursing, proper diet and stimulant tonic medicines, and to mitigate any urgent symptoms that may arise.

Mr. Thacker's mixture consisting of Camphor, Nitre, Datura, Chiretta and Arrack has been recommended by Veterinary Surgeons Hallen and Pease. I have used this mixture substituting margosa bark for chiretta, and have found it answer well when due attention is paid to the nursing.

The animal should be fed with liquid food such as rice conjee with the boiled rice mixed. Peas (*kadalai*) gruel is recommended by the Indian Plague Commissioners when there is a tendency to excessive purging as it is more astringent and stimulating than rice conjee. Simple water should be very sparingly given, as excessive draughts have been known to increase the diarrhœa and hasten death.

Very mild laxatives are useful in the early stage of the disease when there is constipation; but few villagers make out the disease at this stage. When there is excessive diarrhœa for more than 24 hours, it should be checked by adding some suitable astringents such as catechu or gallnuts to Veterinary Surgeon Thacker's mixture above referred to. Decoction of "beli" fruit may be also added to the mixture if the diarrhœa and dysentry progress.

There are, however, serious obstacles to the treatment of rinderpest in the villages of the interior of Ceylon. The villagers do not care about the nursing of any animal that is attacked with the disease. They do not even think of providing shelter for it, and it is allowed to roam about along with the healthy animals. They seem too lazy to attend to the nursing or housing, and are always ready with their excuses. The utmost they can be persuaded to do of their own accord, is to tie the sick animal to a tree and give it some straw or grass. They are prejudiced against the new method of treatment. In fact, they have no faith in any kind of treatment for rinderpest, and believe that only their deities can either kill or cure the infected animals.

No doubt some specific or heroic remedy that could effect almost a cent per cent cure will carry conviction to their minds and overcome their prejudice. But hitherto veterinary science has not discovered any specific for rinderpest, and nursing has been considered the most important part of the treatment, which, unfortunately, is just what is most neglected.

Under such circumstances, it is with no little eagerness that the veterinary world has been looking forward to the results of the investigations recently carried on by Dr. Koch at the Cape; and the telegram published the other day, to the effect that he claims to have discovered a remedy for rinderpest will be hailed with intense joy by cattle-owners all over India and Ceylon. The exact nature of the discovery has, however, yet to be ascertained, and we must receive the news with caution, lest we meet with disappointment. Let us however trust that it is something more than the hasty conclusion of an impulsive enthusiast, and that Dr. Koch has at last hit upon something that will make him a benefactor to the whole agricultural and veterinary world.

E. T. HOOLE.

Anuradhapura, 20th Feb. 1897.

"NITRAGIN."

We have much pleasure in announcing that we have received some specimens of "Nitragin" (pure cultivation bacteria for leguminous crops) prepared according to Doctors Nobbe's and Hiltner's direction in Höchst-on-the-Main. The Nitragin is contained in bottles inserted in a brown paper case, and has to be kept protected from light and heat. The following are certain facts referring to the material as set forth by the manufacturers:—

The principal food-materials abstracted from the soil by plants, and which therefore require to be replaced in the form of manures, are potash, phosphoric acid, lime and nitrogen.

Respecting the last it has been known that leguminous crops, such as clover, vetches, peas, beans, lupines, etc., do not usually require to be manured with nitrogen (in the form of nitre or ammoniacal compounds), and yet under favourable conditions yield rich harvests, whilst the soil is even enriched with nitrogen.

The reason of this peculiar behaviour for many years remained unexplained, but the onward march of modern science has now demonstrated the ability of leguminous plants to abstract nitrogen from the air—only, however, by the aid of a specific kind of micro-organism, a bacterium that resides in the characteristic nodules on the roots. If these bacteria are not at the disposal of the plant, then it loses its ability to utilise the atmospheric nitrogen, and hence it is found that not every leguminous plant is able to flourish luxuriantly without nitrogeneous manure: many remain small and stunted under conditions otherwise favourable, and evidently suffer from the lack of nitrogen.

It is therefore a matter of extreme importance to the farmer to make certain that each field of legumes is supplied with the necessary quantum of bacteria; only then can he expect to obtain full crops from poor sandy soils without nitrogen manures (*i. e.*, without saltpetre, ammonia etc.) and only then will he reap the advantage of a soil enormously enriched with nitrogen.

The wide bearing of this newly-discovered principle has already been taken into practical consideration, and fields are now inoculated, that is to say, strewn with earth in which legumes have already flourished. This method, however, apart from its great cost and the loss of time and labour entailed, also involves the danger of disseminating injurious as well as useful bacteria.

This disadvantage is, however, now completely overcome by the Patent Germ Fertiliser

NITRAGIN

which consists of a pure cultivation of the specific bacteria of legume nodules in a suitable medium.

The inoculation of the seed or of the soil with the Germ Fertiliser, according to the directions given below, possesses the following advantages:—

1. Every single seed is surrounded with bacteria which, after germination, penetrate the root-hairs and commence their rôle as collectors of nitrogen, so that a good crop is secured in the poorest soil without nitrogenous manures.

2. Through the storage of nitrogen by the bacteria, the soil itself becomes richer in nitrogen in an assimilable state, to the advantage of the other crops grain in rotation.

3. The disadvantages of the mode of inoculation previously adopted are avoided.

4. Manuring with nitrogen in the form of saltpetre, ammonium salts, etc., is absolutely unnecessary.

DIRECTIONS FOR USE.

Every bottle contains sufficient for inoculation of 2½ roods.

If the contents of the bottle have already become liquid, they are used as described below for the direct inoculation of the seed. If solid, the contents can be easily liquefied by warming the bottle gently for a few minutes, for instance, in the trousers-pocket, in tepid water, or in a warm room. Exposure to temperatures above the heat of the body, which is ample sufficient to melt, or to direct sunlight must under all circumstances be strictly avoided.

The liquid contents are poured into a vessel containing one to three pints of clean water (carefully washing out the whole contents of the bottle with a little water), and then shaken or stirred until the Fertiliser is equally distributed throughout the vessel and the bacteria are well mixed in the water.

The inoculated water thus prepared is poured over the seed and worked with the hands (or the shovel) until every seed has been moistened. If the quantity of water is insufficient more must be added, but usually for small seed a pint and a half will suffice and for large seeds two or three quarts. The moistened seed is then reduced to a condition suitable for sowing by mixing with some dry sand or fine earth and if necessary allowing it to stand, turning it over from time to time; too great dryness is deleterious. The sowing and turning in is carried out in the manner usually practised. If possible however avoid sowing in glaring sunlight.

Instead of inoculating the seed the same, in some cases, better results are obtained by inoculating the soil by means of inoculated earth. For this purpose for every 2½ roods ½ cwt. earth is inoculated in the above-described manner, using a proportionately larger quantity of water; the inoculated earth is then dried in the air or mixed with dry earth, scattered equally over the field, and worked in 3 or 4 inches deep.

For larger surfaces than 2½ roods a corresponding number of bottles must be used (8 bottles to 5 acres).

At the bacteria are absolutely innocuous, there is no fear of danger from the bottles being left about or employed for other purposes.

Nitragin for the following crops are now obtainable from the Faberwerke Vorm. Meister Lucius and Bruning, at Höchst-on-Main or 6 and 7 Cross Lane, St. Mary's Hill, London, E.C. :—

Common Pea	...	*Pisum sativum.*
Sand Pea	...	*Pisum arvense.*
Common Vetch	...	*Vicia sativa.*
Hairy Vetch	...	*Vicia villosa.*
Common Field Bean or Horsebean	...	*Vicia faba.*
White Lupin	...	*Lupinus albus.*
Yellow Lupin	...	*Lupinus luteus.*
Blue Lupin	...	*Lupinus angustifolius.*
Clover	...	*Trifolium pratense.*
White Clover or Dutch Clover	...	*Trifolium repens.*
Alsike Clover	...	*Trifolium hybridum.*
Carnation Clover or Trifolum.	...	*Trifolium incarnatum.*
Bokhara Clover	...	*Melilotus alba.*
Black Medick	...	*Medicago lupulina.*
Lucerne	...	*Medicago sativa.*
Kidney Vetch	...	*Anthyllis vulneraria.*
Sainfoin	...	*Onobrychis sativa.*
Serradella	...	*Ornithopus sativus.*
Wild Everlasting Pea	...	*Lathyrus sylvestris.*

ARECANUT CULTIVATION IN INDIA.

The Arecanut is described by Dr. Watt as a native of Cochin China, Malayan Peninsula and Islands. It is cultivated throughout tropical India; in Bengal, Assam, Sylhet; but will not grow in Manipur, and only indifferently in Cachar, Burmah, and Siam; in Western India below and above the Ghauts. It does not grow at any distance from the sea and will not succeed above 3,000 feet in altitude. Most villages in Burma, Bengal and South India have their clumps or avenues of betel palm. The betel palm groves and pepper betel-leaf houses are perhaps the most characteristic features of the river-banks in Sylhet, and from these plantations the inhabitants of Cachar and Manipur obtain their supplies.

MYSORE.—The following facts relative to the cultivation and yield of Arecanuts in Mysore are given in the *Mysore Gazetteer*:—There are two varieties of the Areca in Mysore, the one bearing large and the other small nuts, the produce of both kinds being nearly equal in value and quantity.

The manner of arecanut cultivation is different in different districts of Mysore. The method followed in Channapatna is as follows:—The seed is ripe about the middle of January to February, and is first planted in a nursery. Trenches are dug and half-filled up with sand, on the surface of which is placed a row of the ripe nuts. These are again covered with sand and rich black mould, and are watered once in three days for four months. The young palms are then transplanted to the garden, which had been previously planted with rows of plantain trees at the distance of about four feet. Two young arecas are set in one hole between every two plantain trees.

When there is no rain, the plants are watered every third day. In the rainy season, a trench is dug between every third row of trees to carry off superfluous water, and to bring a supply from the reservoir when wanted. At the end of three years the original plantain trees are removed and a row planted in the middle of each bed and kept up ever afterwards in order to preserve a coolness at the roots of the areca. The trees are five feet high in five years, and begin to produce fruit. The plantation requires no more watering except twice a month during the dry weather.

The methods followed in other parts of Mysore differ in some respects from the one above, but they agree in the essential point, namely, plantain trees are planted with the areca palms, and in most districts trenches are dug to carry off superfluous water. The seedlings, except in one district, are first raised in a nursery and thence transplanted. Manure is used in some districts, but watering is resorted to everywhere. A rich black mould or a black soil containing calcareous nodules is prefered for arecanut cultivation.

The areca plantations in Mysore are interspersed with coconut, lime, jak, and other trees, which add to the shade and to the freshness of the soil.

In Kolaba.—In Kolaba, the betel palm is grown in large numbers in coconut plantations along the Alibag coast. The nuts are buried two inches deep in loosened and levelled soil. When the seedlings are a year old, they are planted out in July and buried about two feet deep. The soil is then enriched by a mixture of salt and *nachni*, sometimes with the addition of cowdung. Now watering is required at first, but after four months the plant is watered either daily or at intervals of one or two days. If water is not stinted, the betel palm yields nuts in its fifth or sixth year. The tree yields twice or thrice a year about 250 nuts being an average yearly yield.

In Janjira or Shivardha.—In Janjira, the betel palm is the most important of garden crops. Shivardhan betel-nuts are known over the whole of the Bombay Presidency. The seed-nut is sown in February or March about half-foot deep and is carefully watered. After about four months the plant appears and is watered every second day. When it is four years old it is planted out about two feet and-a-half below the surface, a foot and a quarter of the seedling being buried under the ground, while a round trench of the same depth is left for the water. When the tree is nine or ten years old, it begins to bear fruit, the yearly yield varying from 25 to 400 nuts. This variety fetches, relatively, a much higher price in the market than any of the others.

(*To be continued.*)

GENERAL ITEMS.

In 1895, it is reported officially, the area under arecanut cultivation in the Kegalla District was 24,680 acres, or more than one-third of all Ceylon. The palms bear best in that district where the yield has at all times been famous, and whence in all historic times there has been a considerable import to Southern India. The area in Three Korales under cultivation is 6,527 acres, with an average yield of 783¼ million nuts. The yield per acre on unplanted (*i.e.* naturally grown) and over-crowded gardens is 120,000 nuts per acre. The nuts are measured by an *amunam* of 24,000 to 26,000 nuts. Therefore, the average weight equals about 5 amunams. An *amunam* weighs 2½ cwt. Therefore the average yield per acre represents in weight 12½ cwt (N.B.—Well-cultivated and scientifically-planted *arambes* yield nearly a ton an acre. Statistics quoted from a small acreage in Madras give nearly two tons.)

To ascertain the weight of cattle, measure the girth close behind the shoulder and the length from the fore-part of the shoulder-blade along the back to the bone at the tail which is in a vertical line with the buttock both in feet. Multiply the square of the girt, expressed in feet, by five times the length, and divide the product by 21; the quotient is the weight, nearly, of the four quarters, in imperial stones of 14 lb. avoirdupois. For example, if the girt be 6 ft., and the length 5¼ ft., we shall have 6 × 6 = 36, and 5¼ × 5 = 26¼; then 36 × 26¼ = 945, and this divided by 21 gives 45 stones exactly. It is to be observed, however, that in very fat cattle the four quarters will be about one twentieth more, while in those in a very lean state they will be one-twentieth less than the weight obtained by the rule.

G. F. Plunkett, who contributes the Poultry Notes to the *Australian Tropiculturist* for December, advises poultry keepers, if they wish to prevent loss of chickens, (1) to keep their poultry houses clean and free from lice, by regular cleaning out, white-washing and sprinkling the floor with lime; (2) by keeping the chickens off the wet grass in the early morning; (3) by preventing inbreeding by introducing fresh blood into the broods.

The Manning River correspondent of the *Sydney Mail* writes:—At a meeting of the committee of the Agricultural and Horticultural Association, held here recently, Mr. W. Allen, of Dumaresque Island, detailed the result of his experience in the adoption of the treatment of seed oats by immersion in hot water, as recommended by Dr. Jansen. Half of the seed required for sowing was treated for a few minutes with water at a temperature of 145 deg. F.; it was then placed in cold water and sown immediately. The remainder of the seed untreated was also sown afterwards. The two plots of soil used were of the same quality, and every endeavour was made to give the same care and attention to the treatment and cultivation of each seed. The final result proved unquestionably that, although no apparent difference could be noticed in the growth of the two lots of seed, the portion of the seed treated with hot water was absolutely free from any trace of smut or other imperfection. Of the untreated seed it was found that at least 15 per cent. of the heads of oats were destroyed by disease. Much interest has been taken in the district in Mr. Allen's experiment, and arrangements are being made for further trials with scalded seed at various temperatures of water.

On the subject of selection of seeds Dr. Cobb, of the Agricultural Department, New South Wales, says:—"The grading of seeds is almost wholly neglected by farmers in most of the great agricultural countries, and this very fact is one that is sometimes pointed out in defence of not grading the seed. I have heard it said in substance by a well-known teacher of agriculture—a man whose word is respectfully listened to by thousands of farmers—that there could not be much in graded seed, or farmers would not so generally neglect the matter. . . One might pertinently ask this teacher of agriculture how, if a practice is to be its own sufficient defence, any improvement is ever to take place, and enquire of the advocates of pinched seed why Dame Nature does not provide all her plants with pinched and puny seed, if they are so much better. The truth is that, other things being equal, plump seed is much better than shrivelled seed, and that where the results obtained from shrivelled seed are better than those obtained from plump seed, the result is due to other factors than the quality of the seed. . . . The vitality of seed diminishes with age, hence it is necessary in comparative experiments (except such as are devoted to ascertaining the rate of decrease in vitality due to age) to make sure that the seed used in the different plots and rows is of the same age."